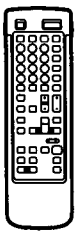
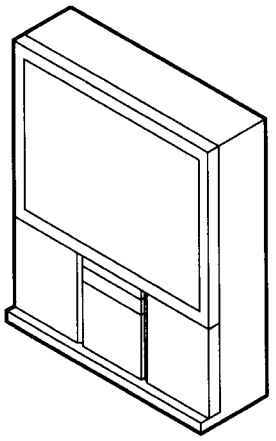
SERVICE MANUAL

RX-1E CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.
KP-46S4	RM-831	AEP	SCC-N24A-A
KP-46S4K	RM-831	OIRT	SCC-N25A-A
KP-46S4U	RM-831	UK	SCC-N26A-A
KP-53S4	RM-831	AEP	SCC-N24B-A
KP-53S4K	RM-831	OIRT	SCC-N25B-A
KP-53S4U	RM-831	UK	SCC-N26B-A



RM-831



KP-46S4/46S4K/46S4U
KP-53S4/53S4K/53S4U

MICROFILM

PROJECTION TV

SONY

※ Please file according to model size. ..... ■

46 53

SPECIFICATIONS

Television system	B/G/H,D/K,I,L
Colour system	PAL/SECAM and NTSC 3.58/NTSC4.43 (VIDEO IN)
Channel coverage	See " Receivable channels and channel displays " at the bottom.
Projected picture size	116cm (46 inches)
Terminals	133cm (53 inches)
Rear	Center speaker input terminals, 2 terminals
	(L,R), audio outputs - phono jacks (variable)
	1, 21-pin Euro connector (CENELEC standard)
	-inputs for audio and video signals
	- inputs for RGB
	- outputs of TV audio and video signals
	2/ 2, 21-pin Euro connector
	- inputs for audio and video signals
	- inputs for S Video
	- outputs for audio and video signals (selectable)
	2, S video inputs - 4 pin DIN
	(L,R), audio inputs - phono jacks
	4/ 4, 21-pin Euro connector
	- inputs for audio and video signals
	- inputs for S video
	- outputs for audio and video signals (monitor out)
	4, S video inputs - 4 pin DIN
	(L, R), audio inputs - phono jacks
	S video outputs 4-pin DIN (monitor out)
	(L, R) , audio outputs - phono jacks (fixed)
Front	3, video input-phono jack
	(L, R) , audio inputs-phono jacks
	3, S video input-4-pin DIN
	, headphone jack - stereo minijack
Sound output	2 x 30W (music power)
	2 x 15W (RMS)
Power consumption	225W
Dimensions(WxHxD)	KP-46S4K : 1104 x 1267 x 512 mm
	KP-53S4K : 1164 x 1335 x 650 mm
Weight	KP-46S4K : 79kg
	KP-53S4K : 90kg
Supplied accessories	RM-831 Remote Commander
	One IEC designation R6 battery
Other features	Digital comb filter (High resolution)
	PIP (Picture-in-picture)
	FASTEXT
	NICAM (B/G, L, I)
	B/G STEREO
	D/K STEREO

Design and specifications are subject to change without notice.

Receivable Channels and Screen Displays

	Receivable channels	Indication on the screen
PAL B/G/H	E2..12 21..69	C02 C03 C04..C12 C21..C69
CABLE TV (1)	S1..41	S01 S02..S41
CABLE TV (2)	S01..S05 M1..M10 U1..U10	S42..S46 S01..S10 S11..S20
ITALIA	A B C D E F G H H1 H2 21..69	C11..C69
SECAM D/K	R01..R12 R21..R60	C02..C12 C21..C60
SECAM L	F2..F10 F21..F69	C01..C12 C21..C69
PAL I	B21.. B68	C21..C68

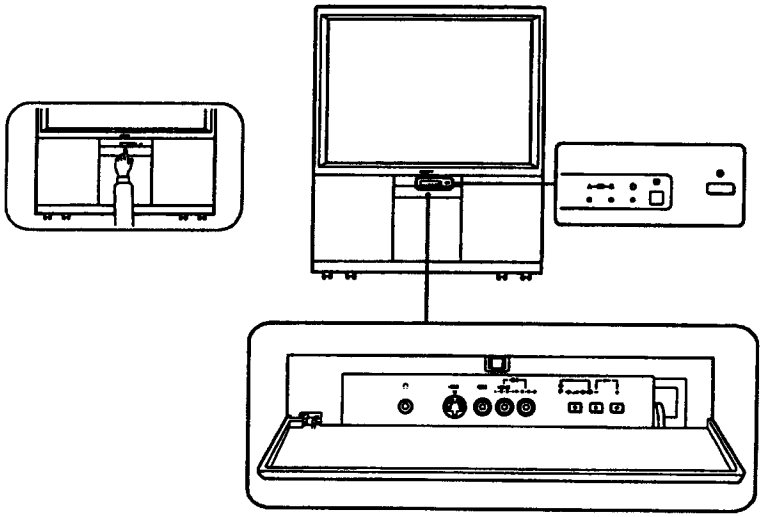
SECTION 1
GENERAL

Overview

The operation instruction mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.

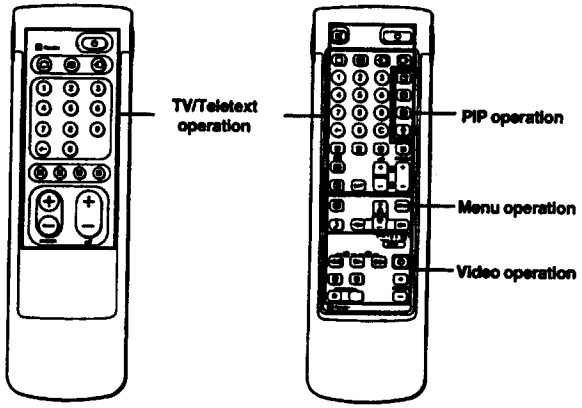
This section briefly describes the buttons and controls on the TV set and on the Remote Commander. For more information, refer to the pages given next to each description.

TV set-front



Symbol	Name	Refer to page
⏻	Main power switch	7, 13
⏻	Standby indicator	13
A-CD-B	Stereo A/B indicators	15
Ω	Headphones jack	22
-⊖ 3, -⊖ 3, -⊖ 3	Input jacks (S video/video/audio)	22
	Function selector (Programme/volume/input)	14
-/+	Adjustment buttons for function selector	14

Remote commander RM-831



Simple side

Full-Function side

Note
The SAT button does not operate with this TV.

TV/Teletext operation

Symbol	Name	Refer to page
🔇	Mute on/off button	14
⏻	Standby button	13
▢	TV power on/TV mode selector button	13
Ⓣ	Teletext button	14
-⊖	Input mode selector	14
⊖	Output mode selector	23
1,2,3,4,5,6, 7,8,9,and 0	Number buttons	13
-/--	Double-digit entering button	13
C	Direct channel entering button	10
🔊+/-	Volume control button	13
PROGR +/-	Programme selectors	13
	Teletext page access buttons	19
	Picture adjustment button	15
♪	Sound adjustment button	15
	On-screen display button	14
	Teletext hold button	19
	Time display button	14
	Fastext buttons	19

PIP (Picture-in-picture) operation

Symbol	Name	Refer to page
	PIP on/off button	17
	PIP source selector	17
	Swap button	17
	PIP position changing button	17

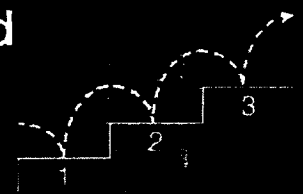
Menu operation

Symbol	Name	Refer to page
MENU	Menu on/off button	7
△+/▽-	Select buttons	7
OK	OK(confirming)button	7
⇦	Back button	7

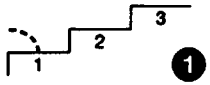
Video operation

Symbol	Name	Refer to page
VTR1/2/3, MDP	Video equipment selector	24
◀◀ ▶ ▶▶ ■ ❚❚ ● ⏻ PROGR +/-	Video equipment operation buttons	24

Getting Started



Step 1 Preparation

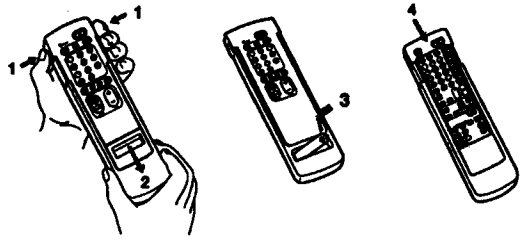


❶ Check the supplied accessories

When you've taken everything out of the carton, check that you have these items:

- RM-831 Remote Commander
- One IEC designation R6 battery

❷ Insert the battery into the Remote Commander



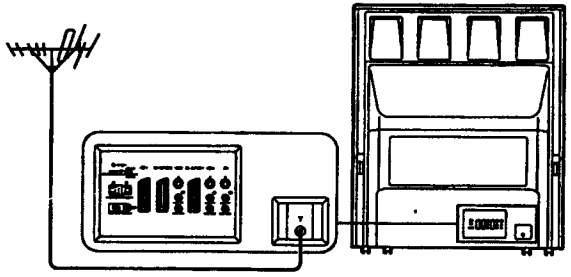
Remove the cover.

Check the correct polarities.

Refit the outside cover making sure that the Full-Function side is visible to use the menu in step 2.

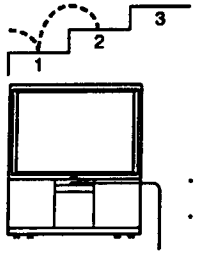
Note: Always remember to dispose of used batteries in an environmental friendly way.

❸ Connect the aerial



Fit an IEC aerial connector attached to 75-ohm coaxial cable (not supplied) to the T socket at the rear of the TV.

Step 2 Adjusting Colour Registration (CONVERGENCE)

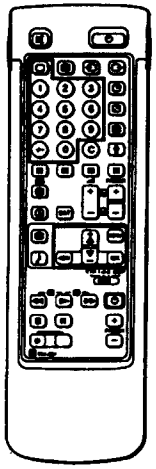


① (main power switch)

Once you have set up the TV, you can choose the language of the menu. Then you should converge the three colour layers (red, green, and blue).

Before you begin

- Check that the Full-Function side of the Remote Commander is visible.
- Locate Menu operation buttons on the Remote Commander. They are shaded in the illustration at the left.



❶ Choose a language

1 Depress ① (main power switch) on the TV unit.
The TV will switch on. If the standby indicator on the TV is lit, press ○ or a number button on the Remote Commander.

2 Press MENU.
The LANGUAGE menu appears. (See Fig. 1).

3 Select the language you want with Δ + or ∇ – and press OK.

4 Press ⇐ to return to the main menu.

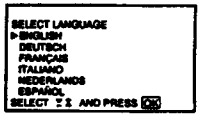


Fig. 1

❷ Display the menu

Press MENU.

The main menu appears. (See Fig.2)

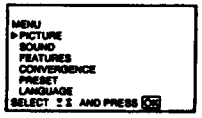


Fig. 2

❸ Converge the red, green and blue lines

1 Select "CONVERGENCE" with Δ + or ∇ – and press OK.
The CONVERGENCE menu appears. (See Fig. 3.)

2 Select "the line" you want to adjust with Δ + or ∇ –.
Key to line adjustment symbols:
I (red vertical – left/right adjustment)
– (red horizontal – up/down adjustment)
I (blue vertical – left/right adjustment)
– (blue horizontal – up/down adjustment)

3 Press OK.
The line to adjust is selected.

4 Press Δ + or ∇ – to converge the selected line with the centre green line and press OK.

To move up (horizontal line) To move right (vertical line)	Press Δ +
To move down (horizontal line) To move left (vertical line)	Press ∇ –

5 Repeat steps 2 to 4 to adjust the other lines, until all the lines have overlapped to form a white cross. (See Fig. 4.)

6 Press MENU to return to TV picture.

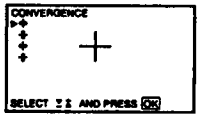


Fig. 3

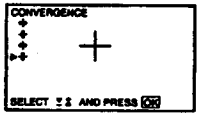
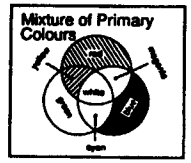
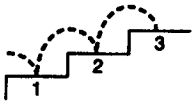


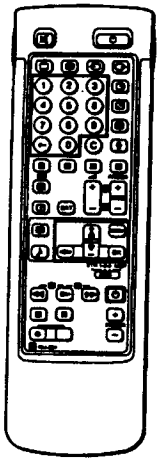
Fig. 4



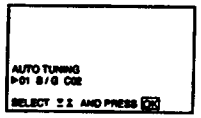
GB

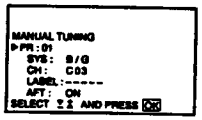
Step 3 Tuning in to TV Stations





You can preset the channels (up to 100 channels) by choosing either the automatic or manual method.
The automatic method is easier if you want to preset all receivable channels at once. Use the manual method if you only have a few channels and want to preset channels one by one.





Preset Channels Automatically

1 Press MENU to display the main menu.
2 Select "PRESET" with △+ or ▽– and press OK.
The PRESET menu appears. (See Fig. 5.)
3 Select "AUTO TUNING" with △+ or ▽– and press OK.
The AUTO TUNING menu appears. (See Fig. 6.)
4 Select the programme with -/- - and enter the digit numbers from which you want to start presetting.
5 Press OK. Select if necessary the TV broadcast system with △+ or ▽– and press OK. (B/G for western European countries, D/K for eastern European countries, L for France and I for the United Kingdom.)
6 Using △+ or ▽–, select C (to start presetting regular channels) or S (to start presetting cable channels) and press OK.
The automatic channel presetting starts.
When presetting is finished, the preset menu reappears. All available channels are now stored on successive number buttons. If you want to change to another broadcasting system, repeat steps 3 to 5.
7 Press MENU to return to TV picture.

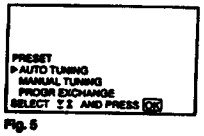


Fig. 5

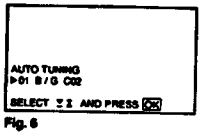


Fig. 6

To go back to the main menu
Keep pressing ⇐ .

To stop automatic channel presetting
Press ⇐ on the Remote Commander.

Notes
- After presetting the channels automatically, you can check which channels are stored on which programme positions.
- You can exchange the programme positions to have them appear on screen in the order you like. For details, see "Exchanging the Programme Positions" on page 10.

Use this method if there are only a few channels in your area to preset or if you want to preset channels one by one.

If you have made a mistake
Press ⇐ to go back to the previous position.

To return to the main menu
Keep pressing ⇐.

Preset Channels Manually

1 Press MENU to display the main menu.
2 Select "PRESET" with △+ or ▽– and press OK. (See Fig. 7.)
3 Select "MANUAL TUNING" with △+ or ▽– and press OK.
The MANUAL TUNING menu appears. (See Fig. 8.)
4 Using △+ or ▽–, select the programme position to which you want to preset a channel, and press OK.
You can also select the programme position with the number buttons (e.g. for programme 24, press -/—, 2 and 4).
5 Select, if necessary, the TV broadcast system (B/G for western European countries, D/K for eastern European countries, L for France and I for the United Kingdom) with △+ or ▽–. Then press OK.
6 Using △+ or ▽–, select C (to start presetting regular channels) or S (to start presetting cable channels) and press OK.
7 Press △+ or ▽– until the channel you want appears on the screen.
You can also select the channel directly using the number buttons. Press C (once for VHF/UHF channels, twice for cable TV channels), then the number buttons (e.g., for channel 5, press 0 and 5).
Then press OK.

To preset other channels

Repeat steps 4 to 7.

To return to TV picture

Press MENU.

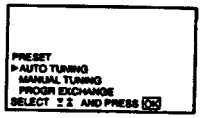


Fig. 7

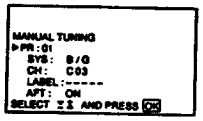
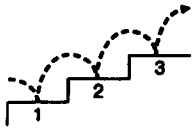


Fig. 8

GB

Additional Presetting Functions



This section shows you additional presetting functions such as exchanging or skipping programme positions, captioning a station name, and manual fine-tuning.

You can skip this section, if not needed.

Before you begin

- Check that the 'Full Function side of the Remote Commander is visible.
- Locate the Menu operation buttons.

PROGRAMME EXCHANGE

Exchanging Programme Positions

With this function, you can exchange the programme positions to a preferable order.

1 Press MENU to display the main menu.

2 Select "PRESET" with Δ+ or ∇– and press OK.
The PRESET menu appears.

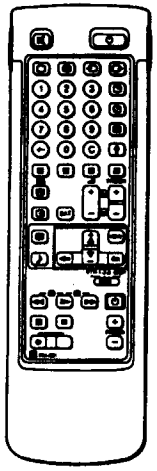
3 Select "PROGRAMME EXCHANGE" with Δ+ or ∇– and press OK.
The PROGRAMME EXCHANGE menu appears. (See Fig. 9.)

4 Using Δ+ or ∇–, select the programme position you want to exchange with another and press OK.

5 Using Δ+ or ∇–, select the programme position to be exchanged and press OK. Now the two programme positions have been exchanged.

6 Repeat steps 4 and 5 to exchange other programme positions.

7 Press MENU to return to TV picture.



If you have made a mistake
Press ⇐ to go back to the previous position.

To go back to main menu
Keep pressing ⇐.

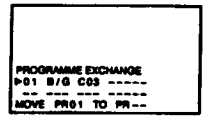


Fig. 9

Tuning in to a Channel Temporarily

You can tune in to a channel temporarily, even when it has not been preset. Use the buttons on the Full-Function side of the Remote Commander.

1 Press C on the Remote Commander for regular channels, or twice to get cable channels.
The indication "C" ("S" for cable channels) appears on the screen. (See Fig. 10.)

2 Enter the double-digit channel number using the number buttons (e.g. for channel 4, first press 0, then 4).
The channel appears.
However, the channel will not be stored.

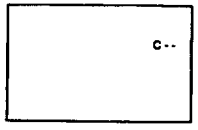


Fig. 10

MANUAL TUNING

Skipping Programme Positions

You can skip unused programme positions when selecting programmes with the PROGR +/– buttons. However, the skipped programmes may still be called up when you use the number buttons.

1 Press MENU to display the main menu.

2 Select "PRESET" with Δ+ or ∇– and press OK.
The PRESET menu appears.

3 Select "MANUAL TUNING" with Δ+ or ∇– and press OK.
The MANUAL TUNING menu appears. (See Fig.11.)

4 Using Δ+ or ∇–, select the programme position which you want to skip and press OK.

5 Press Δ+ or ∇– until "- - -" appears in the SYS position. (See Fig. 12.)

6 Press OK.
When you select programmes using the PROGR +/– buttons, the programme position will be skipped.

7 Repeat steps 4 to 6 to skip other programme positions.

8 Press MENU to return to TV picture.

If you have made a mistake
Press ⇐ to go back to the previous position.

To go back to main menu
Keep pressing ⇐.

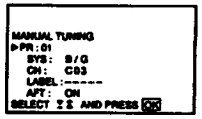


Fig. 11

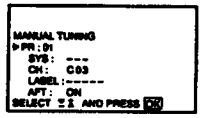


Fig. 12

MANUAL TUNING

Captioning a Station Name

You can "name" a channel using up to five characters (letters or numbers) to be displayed on the TV screen (e.g. BBC1). Using this function, you can easily identify which channel you are watching.

1 Press MENU to display the main menu.

2 Select "PRESET" with Δ+ or ∇– and press OK.
The PRESET menu appears.

3 Select "MANUAL TUNING" with Δ+ or ∇– and press OK.
The MANUAL TUNING menu appears.

4 Select "PR" with Δ+ or ∇– and press OK.

5 Select programme position you want to caption with Δ+ or ∇– and press OK.

6 Select "LABEL" with Δ+ or ∇– and press OK.

7 Select a letter or number with Δ+ or ∇– and press OK.
Select other characters in the same way. If you want to leave an element blank, select - and press OK. (See Fig. 13.)

8 Repeat steps 4 to 7 to caption names for other channels.

9 Press MENU to return to TV picture.

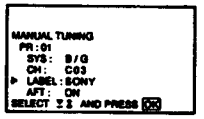


Fig.13

GB

MANUAL TUNING

Manual Fine-Tuning

Normally, the AFT (automatic fine-tuning) is already operating. However, if the picture is distorted, you can use the manual fine tuning function to obtain better picture reception.

1 Press MENU to display the main menu.

2 Select "PRESET" with △+ or ▽– and press OK.
The PRESET menu appears.

3 Select "MANUAL TUNING" with △+ or ▽– and press OK.
The MANUAL TUNING menu appears.

4 Select "PR" with △+ or ▽– and press OK.

5 Select programme position you want to manually fine-tune with △+ or ▽– and press OK.

6 Select "AFT" with △+ or ▽– and press OK.

7 Select "OFF" with △+ or ▽– and press OK. (See Fig. 14.)

8 Fine-tune the channel with △+ or ▽– so that you get the best TV reception. As you press the cursor buttons, the frequency changes from – 128 to + 127.

9 After fine tuning, press OK.
Now the fine-tuned level is stored.

10 Repeat steps 4 to 9 to fine-tune other channels.

11 Press MENU to return to TV picture.

To reactivate AFT (automatic fine tuning)
Repeat from the beginning and select "ON" in step 7.

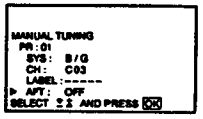
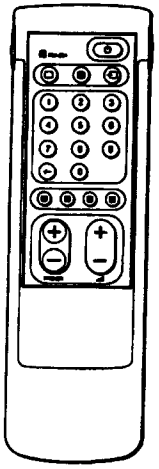


Fig. 14

Operating Instructions

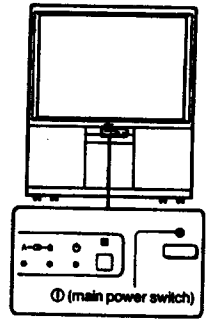
GB

Watching the TV



If no picture appears when you depress ⏻ on the TV and if the standby indicator on the TV is lit, the TV is in standby mode.
Press ▢ or one of the number buttons to switch it on.

This section explains the basic functions you use while watching TV. Most of the operations can be done using the simple side of the Remote Commander.



Switching the TV on and off

Switching on

Depress ⏻ (main power switch) on the TV unit.

Switching off temporarily

Press ⏻ on the Remote Commander.
The TV enters standby mode and the standby indicator on the front of the TV lights up.

To switch on again

Press ▢, PROGR +/–, or one of the number buttons on the Remote Commander.

Switching off completely

Depress ⏻ (main power switch) on the TV unit.

Selecting TV Programmes

Press PROGR +/– or press the number buttons.

To select a double-digit number

Press -/--, then the numbers.
For example, if you want to choose 23, press -/--, 2, and 3.

Adjusting the Volume

Press ◿ +/–.

Operating the TV Using the Buttons on the TV

With the –/+ buttons on the TV, you can select programmes, adjust the volume, and select video input sources.

To switch on the TV from the standby mode

Press the –/+ buttons.

To reset picture and sound controls to the factory preset level (RESET function)

Press the –/+ buttons simultaneously.

To select TV programmes

Press P repeatedly until the programme number appears, then press the –/+ button to select.

To adjust the volume

Press P repeatedly until the volume bar appears, then press the –/+ button to adjust. (See Fig. 15.)

To select video input sources

Press P repeatedly until the ⇥ (video input indication) appears, then press the –/+ button to select. Each pressing the button, the indication changes as follows.

AV1→RGB→AV2→YC2
↑ ↓
YC4←AV4←YC3←AV3

After the video input source is selected, the volume bar appears. Press the –/+ button to adjust the volume. (See Fig. 16.)

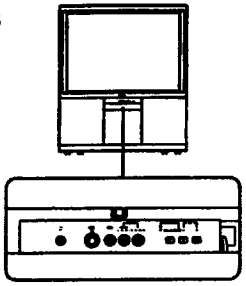


Fig. 15

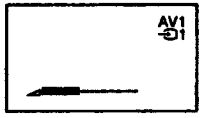
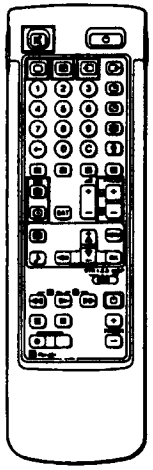


Fig. 16

Watching Teletext or Video Input

For details of the teletext operation, refer to page 19.

For details of the video input picture, refer to page 23.



Watching teletext

1 Press T to view the teletext.
2 For teletext operation, enter a 3-digit page number with the number buttons to select a page.
For fastext operation, press one of the coloured buttons.
For both operations, press ⊕ (PAGE +) for the next page or ⊖ (PAGE –) for the preceding page.
3 To go back to the normal TV picture, press ▢.

Watching a video input picture

1 Press ⇥ repeatedly until the desired video input appears.
2 To go back to the normal TV picture, press ▢.

More Convenient Functions

Use the Full-Function side of the Remote Commander.

Displaying the on screen indications

- Press ⓘ once to display all the indications.
- Press ⓘ again to make the indications disappear.

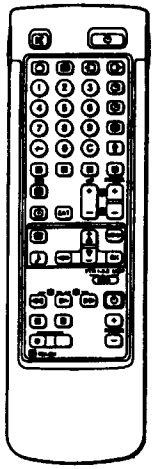
Muting the sound

Press 🔇.
To resume normal sound, press 🔇 again.

Displaying the time

Press ⏲. This function is available only when teletext is broadcast.
To make the time display disappear, press ⏲ again.

Adjusting and Setting the TV Using the Menu



Adjusting the Picture and Sound

Although the picture and sound are adjusted at the factory, you can adjust them to suit your own taste. You can also select dual sound (bilingual) programmes when available or adjust the sound for listening with the headphones.

1 Press ◐ (for picture) or ♪ (for sound) on the remote Commander.
or
Press MENU and select "PICTURE" or "SOUND," then press OK.
The PICTURE ADJUSTMENT or SOUND ADJUSTMENT menu appears.
(See Fig. 17 or Fig. 18.)
2 Using △+ or ▽–, select the item you want to adjust and press OK.
To move up/down:
From ⓓ position, press ▽– to move down.
From ⓤ position, press △+ to move up.
ⓓ means next page.
ⓤ means previous page.
3 Adjust the setting with △+ or ▽– and press OK.
For the effect of each control, see the table below.
4 Repeat steps 2 and 3 to adjust other items.
5 Press MENU to return to TV picture.

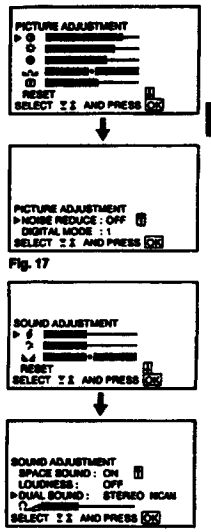


Fig. 17

Fig. 18

If you have made a mistake
Press ⇦ to go back to the previous position.
To go back to the main menu
Keep pressing ⇦.

Note
Hue is only available for NTSC colour systems.

Note on LINE OUT
The audio level and the dual sound mode output from the G jack on the rear correspond to the Headphone VOLUME and DUAL SOUND settings.

When watching a video input picture
You can select DUAL SOUND to change the sound.

Effect of each control

PICTURE ADJUSTMENT	Effect
◐ (contrast)	Less ——— More
☼ (brightness)	Darker ——— Brighter
❁ (colour)	Less ——— More
(hue)	Greenish ——— Reddish
ⓓ (sharpness)	Softer ——— Sharper
RESET	Resets picture to the factory preset levels.
NOISE REDUCE	OFF: Normal ON: When reducing the picture noise
DIGITAL MODE	1: Line Flicker reduction on.
	2: Line Flicker reduction off.

SOUND ADJUSTMENT	Effect
♪ (Treble)	Less ——— More
? (Bass)	Less ——— More
◺◿ (Balance)	More left ——— More right
RESET	Resets sound to the factory preset levels.
SPACE SOUND	OFF: Normal ON: Obtain acoustic sound effect.
LOUDNESS	OFF: Normal ON: When listening to low volume sound.
DUAL SOUND*	A: left channel B: right channel Stereo mono
	STEREO ⟷ MONO
	The selected mode of the A-ⓓ-B indicator on the TV lights up.
∩ (Headphones)	Less◿ ———

*When receiving a NICAM programme

NICAM stereo/monaural STEREO NICAM → MONO
NICAM bilingual NICAM A → NICAM B → MONO

GB

FEATURES

Using the SLEEP TIMER

You can select a time period after which the TV automatically switches into standby mode.

1 Press MENU to display the main menu.

2 Select "FEATURES" with Δ+ or ∇– and press OK.
The FEATURES menu appears.

3 Select "SLEEP TIMER" with Δ+ or ∇– and press OK. (See Fig. 19.)
The time period option changes colour.

4 Select the time period with Δ+ or ∇–.
The time period changes as follows:

OFF → 0:30 → 1:00 → 1:30 → 2:00

5 After selecting the time period, press OK.
The cursor moves back to the left margin and the timer starts counting.
One minute before the TV switches into standby mode, a message is displayed on the screen.

6 Press MENU to return to TV picture.

To switch off the timer
Select "OFF" in step 3.

To check the remaining time
Press ◔.

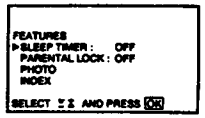


Fig. 19

FEATURES

PARENTAL LOCK

You can prevent undesirable broadcasts from appearing on the screen. We suggest you use this function to prevent children from watching programmes which you consider unsuitable.

1 Select the TV programme which you want to block.

2 Press MENU to display the main menu.

3 Select "FEATURES" with Δ+ or ∇– and press OK.
The FEATURES menu appears.

4 Select "PARENTAL LOCK" with Δ+ or ∇– and press OK.

5 Select "ON" with Δ+ or ∇– and press OK. (See Fig. 20.)

6 Press MENU to return to TV picture.

If you try to select a programme that has been blocked
The message "LOCKED" appears on the blank TV screen.

Cancelling PARENTAL LOCK

1 On the PARENTAL LOCK menu, select "OFF" with Δ+ or ∇–.

2 Press OK.

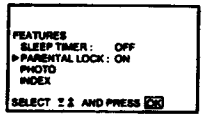
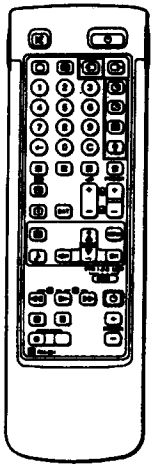


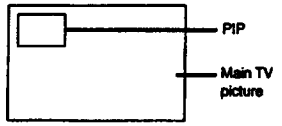
Fig. 20

PIP (Picture In Picture)



Note
RGB input source cannot be displayed in PIP.

With this function you can display a "PIP screen" (small picture) within the main TV picture. In this way you can watch or monitor the video output from any connected equipment (for example from a VTR) while watching TV or vice versa. For information about connection of other equipment, refer to page 22.



Switching PIP on and off

Press ◔.
The PIP screen will be displayed. The PIP picture will come from the source chosen when the TV was last used.

To Switch PIP off
Press ◔ again.

Selecting a PIP source

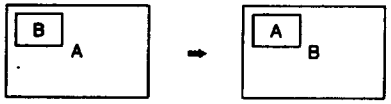
1 Press ↑.
The symbol ↑ will be displayed at the bottom, left-hand corner of the screen.

2 Press –⊖ repeatedly until the desired PIP source is indicated (e.g. TV, AV1, AV2, YC2, AV3, YC3, AV4, YC4).

Note
If no video source has been connected, the PIP picture will be noisy.

Swapping screens

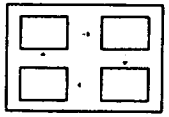
Press ⧉.
The main screen will switch the picture with the PIP screen.



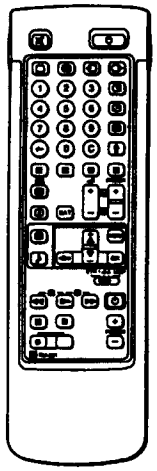
Notes
- If a TV programme is on the PIP screen and a video source on the main picture, and you want to change channels, first press ↑ and then the programme number buttons or PROGR +/–.
- Swapping screens takes about 2 seconds after pressing ⧉.
- After swapping screens if the colour systems of the main and PIP pictures are different, the PIP picture first appears in black and white and then in colour.

Changing the position of the PIP

Press ⊞ repeatedly to change the position of the PIP screen within the main screen. There are four different positions available.



GB



Displaying Frame-by-frame Pictures (PHOTO)

1 Press MENU to display the main menu.
2 Select "FEATURES" with Δ+ or ∇– and press OK.
The FEATURES menu appears. (See Fig. 21.)
3 Select "PHOTO" with Δ+ or ∇– and press OK. (See Fig. 22.)
The preset programme is displayed in nine separated screen in sequence. (See Fig. 23.)

To restore the normal picture

Press OK and MENU.

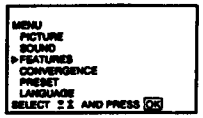


Fig. 21

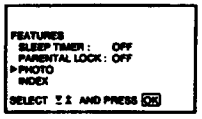


Fig. 22

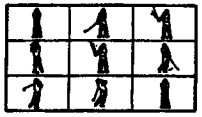


Fig. 23

Checking All the Preset Programmes (INDEX)

1 Press MENU to display the main menu.
2 Select "FEATURES" with Δ+ or ∇– and press OK.
The FEATURES menu appears. (See Fig. 24.)
3 Select "INDEX" with Δ+ or ∇– and press OK. (See Fig. 25.)
The nine preset programmes appear in the separated screen in sequence, switching the picture for each seconds. After all the nine programmes are displayed, each sequence switch the picture with the sound for each five seconds. Press Δ+ also switches to the next nine programmes. (See Fig. 26.)

To restore the normal picture

Press OK and MENU.

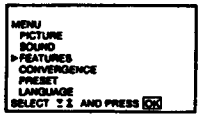


Fig. 24

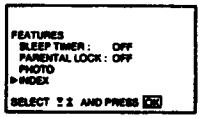


Fig. 25

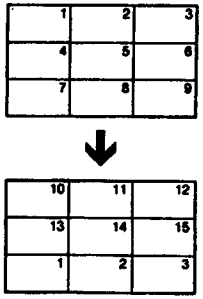
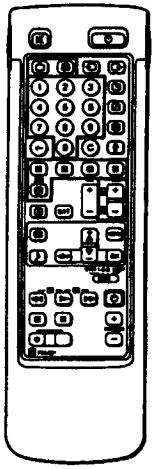


Fig. 26

Teletext



Note
Teletext errors may occur if the broadcasting signals are weak.

With the simple side of the Remote Commander
You can switch teletext on and off, operate Fastext, and directly select page numbers.

Note
Fastext operation is only possible, if the TV station broadcasts Fastext signals.

TV stations broadcast an information service called Teletext via the TV channels. Teletext service allows you to receive various information pages such as weather reports or news at any time you want. For advanced teletext operation, use the buttons on the Full-Function side of the Remote Commander.

Direct Access Functions

Switching Teletext on and off

1 Select the TV channel which carries the teletext broadcast you want to watch.
2 Press ⓣ to switch on teletext.
A teletext page will be displayed (usually the index page).
If there is no teletext broadcast, "No text available" is displayed on the information line at the top of the screen.

To switch teletext off

Press ○.

Selecting a teletext page

With direct page selection

Use the number buttons to input the three digits of the chosen page number.
If you have made a mistake, type in any three digits. Then re-enter the correct page number.
If the requested page is not available at that moment, a message will be displayed.

Accessing next or preceding page

Press ⓟ+ (PAGE+) or ⓟ- (PAGE-).
The next or preceding page appears.

Superimposing the teletext display on the TV programme

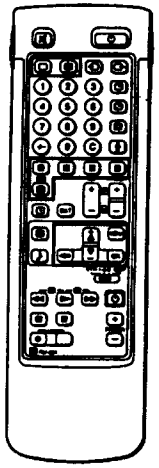
- Press ⓣ once in teletext mode or twice in TV mode.
- Press ⓣ again to resume normal teletext reception.

Preventing a teletext page from being updated

- Press ⓗ (HOLD). The HOLD symbol "ⓗ" is displayed on the information line.
- Press ⓗ to resume normal teletext reception.

Using Fastext

With Fastext you can access pages with one key stroke.
When a Fastext page is broadcast, a colour-coded menu will appear at the bottom of the screen. The colours of this menu correspond to the red, green, yellow and blue buttons on the Remote Commander.
Press the corresponding coloured button on the Remote Commander which corresponds to the colour-coded menu. The page will be displayed after a few seconds.



Note
Some of the features may not be available depending on the teletext service.

Using the Teletext Menu

This TV is provided with a menu-guided teletext system. When teletext is switched on, you can use the menu buttons to operate the teletext menu. Select the teletext menu functions in the following way:

1 Press MENU. The menu will be superimposed on the teletext display. (See Fig. 27.)

2 Using △+ or ▽–, select the teletext function you want and press OK.

INDEX

The index will give you an overview of the contents of the teletext and the page numbers.

ENLARGING

For convenient reading of a teletext page, you can enlarge the teletext display with the ability to scroll up and down. After having selected the function, an information line TOP/BOTTOM/FULL will be displayed. (See Fig. 28.)

To enlarge the upper half with "TOP", select "TOP" and hold down the ▽–. To enlarge the lower half with "BOTTOM," select "BOTTOM" and hold down the △+. The picture can be scrolled up to 12 steps in each direction. Press OK for "FULL" to resume the normal size.

Press ⓣ to resume normal teletext reception.

TEXT CLEAR

After selecting the function, you can watch a TV programme while waiting for a teletext page to be displayed. (See Fig. 29.)

Press ⓣ to resume normal teletext reception.

SUBTITLES

Your teletext service will inform you if a TV programme is subtitles.

After having selected the function the subtitles will be displayed.

REVEAL

Sometimes pages contain concealed information, such as answers to a quiz. The REVEAL option lets you disclose the information. After having selected the function, concealed information will be displayed.

By choosing REVEAL again on the menu, the concealed information will be canceled.

Press ⓣ to resume normal teletext reception.

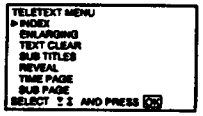


Fig. 27

Fig. 28

Fig. 29

Press OK to select "OFF" for the TIME PAGE setting to cancel the request.

To cancel the request Select SUBPAGE and press OK.

Note:
"TIME PAGE" and "SUBPAGE" features may not be available depending on the teletext service.

TIME PAGE

Your teletext service will inform you, if a time coded page is available. You may have a page (e.g. an alarm page) displayed at a certain time.

1 Using △+ or ▽–, select "ON." Press OK.
The TV programme you were watching before you selected TIME PAGE is restored.
An information window will be displayed at the bottom of the page.

2 To select the desired page, enter three digits for the page number (e.g.452) using the number buttons and press OK.

3 To select the desired time, enter four digits for the desired time (e.g. 1800) using the number buttons and press OK.
The selected time is displayed at the top in the left-hand corner.
At the requested time, the page will be displayed.
Press ⓣ to resume normal teletext mode.

SUBPAGE

You may want to select a particular teletext page from several subpages which are rotated automatically. After having selected the function, an information line will be displayed.

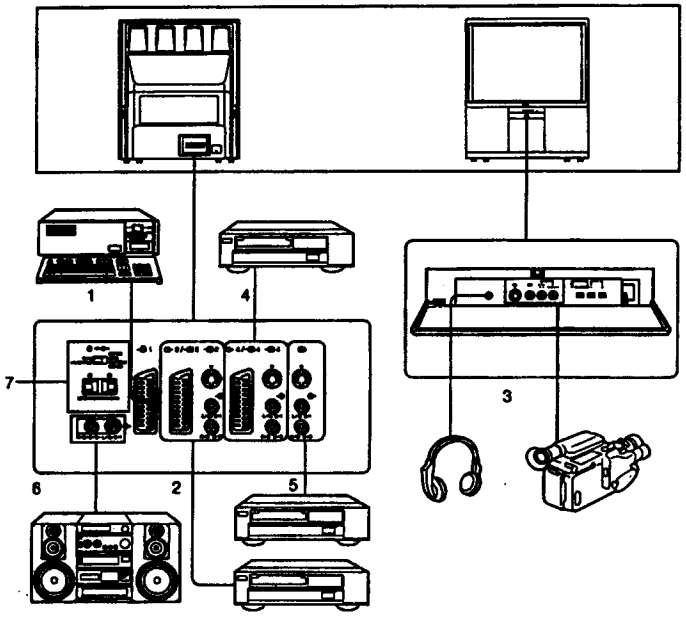
To select the desired subpage, enter four digits using PROGR +/– or the number buttons (e.g. enter 0002 for the second page of a sequence).

GB

Connecting and Operating Optional Equipment

Connecting Optional Equipment

You can connect optional audio-video equipment to this TV such as a VCR, video disc player, and stereo system.



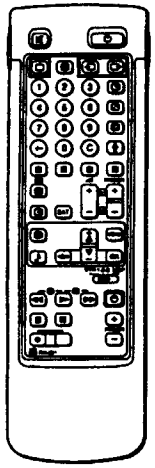
Acceptable input signal	Available output signal
1 Normal audio/video and RGB signal	Video/audio from TV tuner
2 Normal audio/video and S video signal	Video/audio from selected source
3 Normal audio/video and S video signal	No outputs
4 Normal audio/video and S video signal	Video/audio displayed on TV screen (monitor out)
5 No inputs	S/video/audio signal displayed on TV screen (monitor out)
6 No inputs	Audio signal (variable)
7 Centre speaker input. Select to CENTRE when TV set's speakers are used for external amplifier (e.g. Dolby amplifier). For normal operation, switch position is MAIN.	No outputs

To connect a VCR using the 'T' terminal
Connect the aerial output of the VCR to the aerial terminal 'T' of the TV.
We recommend that you tune in the video signal to programme number "0." For details see "Preset channels manually" on page 9.

If the picture or the sound is distorted
Move the VCR away from the TV.

S/video input (Y/C input)
Video signals may be separated into Y (luminance or brightness) and C (chrominance) signals. Separating the Y and C signals prevents them from interfering with one another, and therefore improves picture quality (especially luminance). This TV is equipped with 3 S Video input jacks through which these separated signals can be input directly.

When connecting a monaural VCR
Connect only the white -⊙ jack to both the TV and VCR.



-⊙1 connector always outputs
the audio and video signals from the 'T' aerial terminals.

⊙-4/-⊙4 connector always outputs
the audio and video signals which you are currently watching on the TV screen (i.e. monitor output).

Selecting Input

This section explains how to view the video input picture (of the video source connected to your TV).

Press -⊙ repeatedly to select the input source.

The symbol of the selected input source will appear. (See Fig. 30.)

To go back to the normal TV picture

Press ○.

Fig. 30

Symbol	Input signal
-⊙1	Audio/video input through the -⊙1 connector
-⊙	Audio/RGB input through the -⊙1 connector
-⊙2	Audio/video input through the ⊙-2/ -⊙2 connector
-⊙2	Audio/S video input through the ⊙-2/ -⊙2 or -⊙2 connector (4-pin connector)
-⊙3	Audio/video input through -⊙3 and -⊙3 on the front
-⊙3	Audio/S video input through the -⊙3 (4-pin connector) and -⊙3 connectors
-⊙4	Audio/video input through the ⊙-4/ -⊙4 connector
-⊙4	Audio/S video input through the ⊙-4 / -⊙4 or -⊙4 connector(4-pin connector)

You can also select the input mode using the ⊙-⊙ and -/+ buttons on the TV. In this case, first select -⊙, and then press -/+ buttons to select the input.

Selecting Output from the ⊙-2/-⊙2 Connector

You can select the output signal from the ⊙-2/-⊙2 connector.
The ⊙-2/-⊙2 connector outputs the input signals from the other connectors as indicated below.

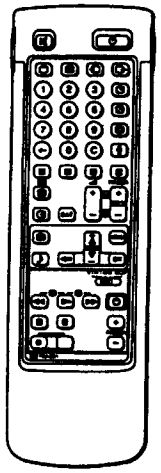
Press ⊙ repeatedly to select the output.

The symbol of the selected output source appears. (See Fig. 31.)

Fig. 31

Symbol	Output signal of the ⊙-2/-⊙2 connector
1 ⊙	Audio/video signal from the -⊙1 connector
2 ⊙	Audio/video signal from the ⊙-2/-⊙2 connector
2 ⊙	Audio/S video signal from the ⊙-2/-⊙2 or -⊙2 connector (4 pin)
3 ⊙	Audio/video signal from the -⊙3, -⊙3 connectors
3 ⊙	Audio/S video signal from the -⊙3, -⊙3 connectors
4 ⊙	Audio/video signal from the ⊙-4/ -⊙4 connector
4 ⊙	Audio/S video signal from the ⊙-4/-⊙4 or -⊙4 connector (4 pin)
TV⊙	Audio/video signal from the 'T' aerial terminal

GB



When recording
When you use the ● (record) button, make sure to press this button and the one to the right of it simultaneously.

Remote Control of Other Sony Equipment

You can use the TV Remote Commander to control most of Sony remote-controlled video equipment such as: beta, 8 mm and VHS VCRs and video disc players.

Tuning the Remote Commander to the equipment

1 Set the VTR 1/2/3 MDP selector according to the equipment you want to control:

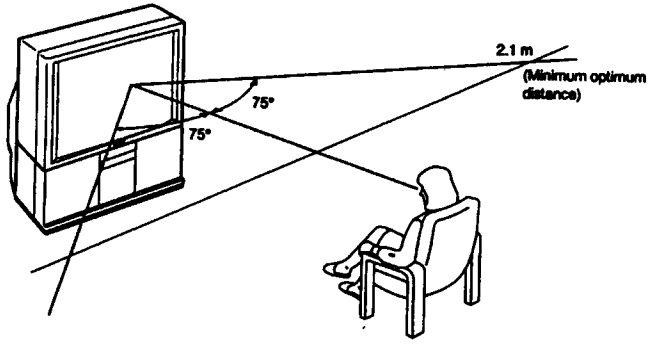
VTR 1: Beta VCR
VTR 2: 8 mm VCR
VTR 3: VHS VCR
MDP: Video disc player

2 Use the buttons indicated in the illustration to operate the additional equipment.
If your video equipment is furnished with a COMMAND MODE selector, set this selector to the same position as the VTR 1/2/3 MDP selector on the TV Remote Commander.
If the equipment does not have a certain function, the corresponding button on the Remote Commander will not operate.

Optimum Viewing Area

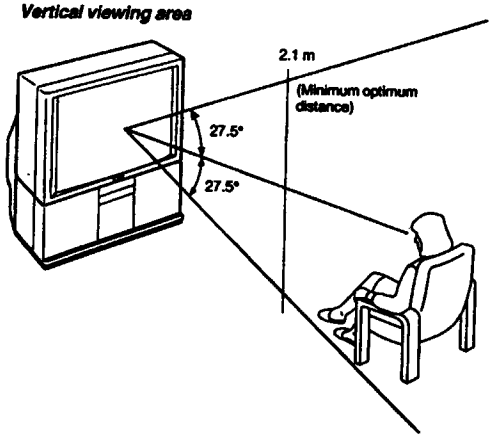
For the best picture quality, try to position the projection TV so that you can view the screen from within the areas shown below.

Horizontal viewing area



Optimum viewing position

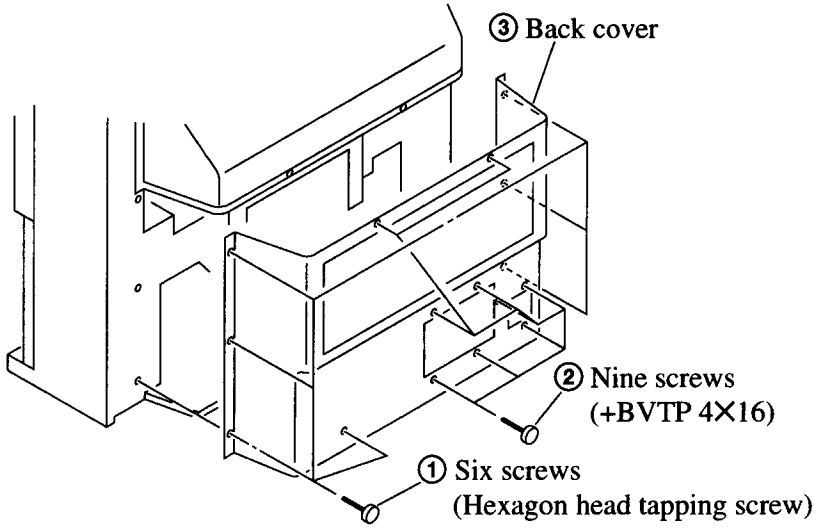
Vertical viewing area



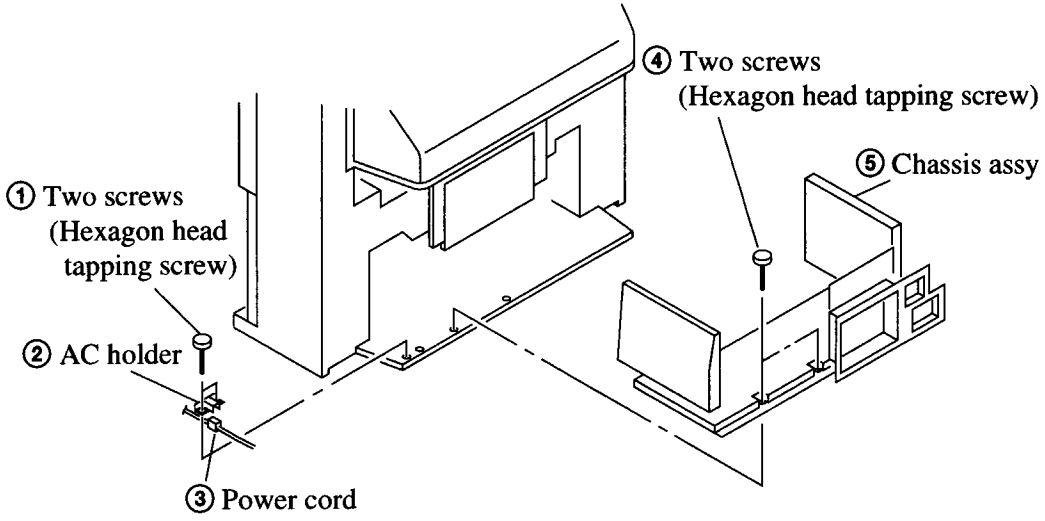
Optimum viewing position

SECTION 2
DISASSEMBLY

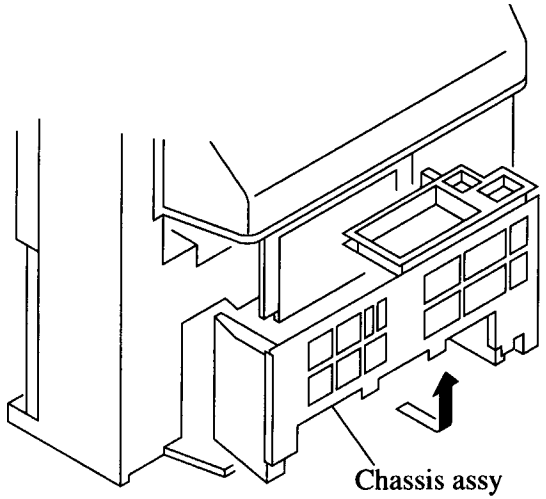
2-1-1. BACK COVER REMOVAL



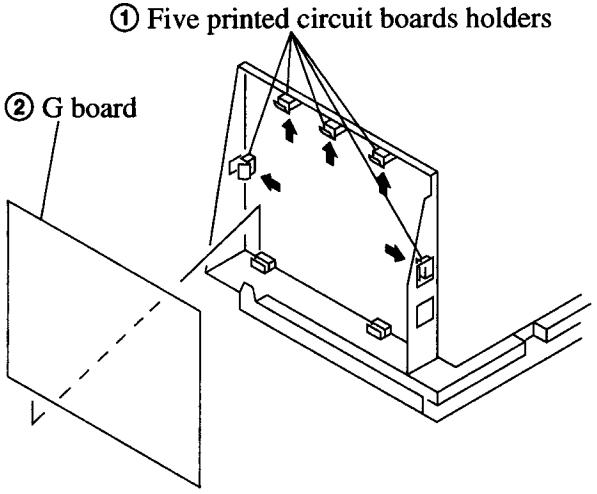
2-1-2. CHASSIS ASSY REMOVAL



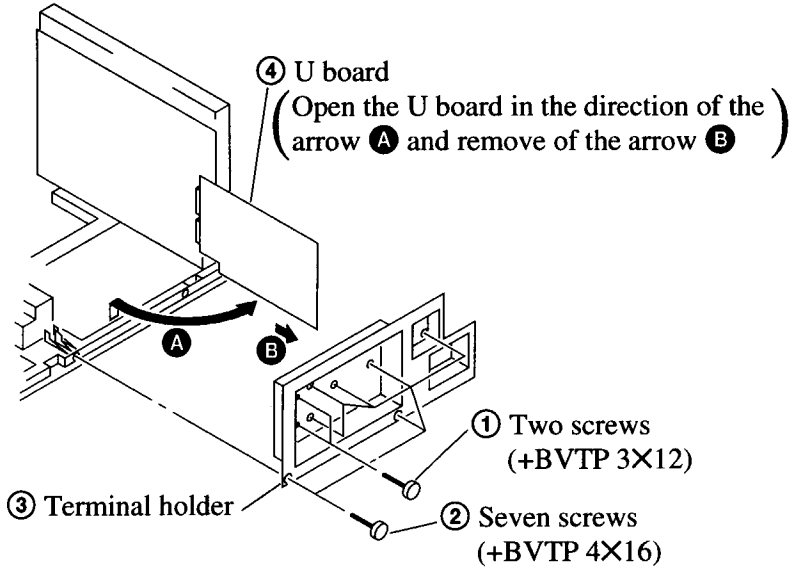
2-1-3. SERVICE POSITION



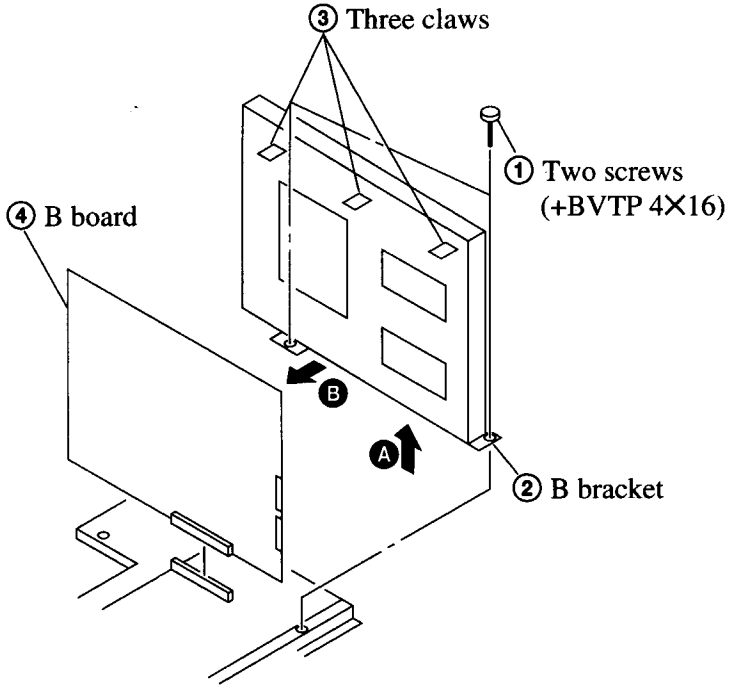
2-1-4. G BOARD REMOVAL



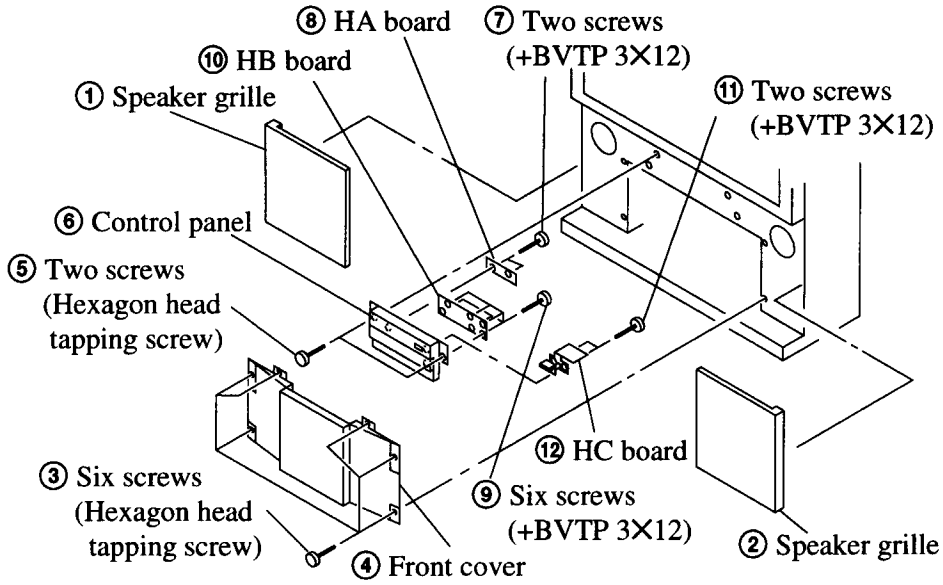
2-1-5. U BOARD REMOVAL



2-1-6. B BOARD REMOVAL

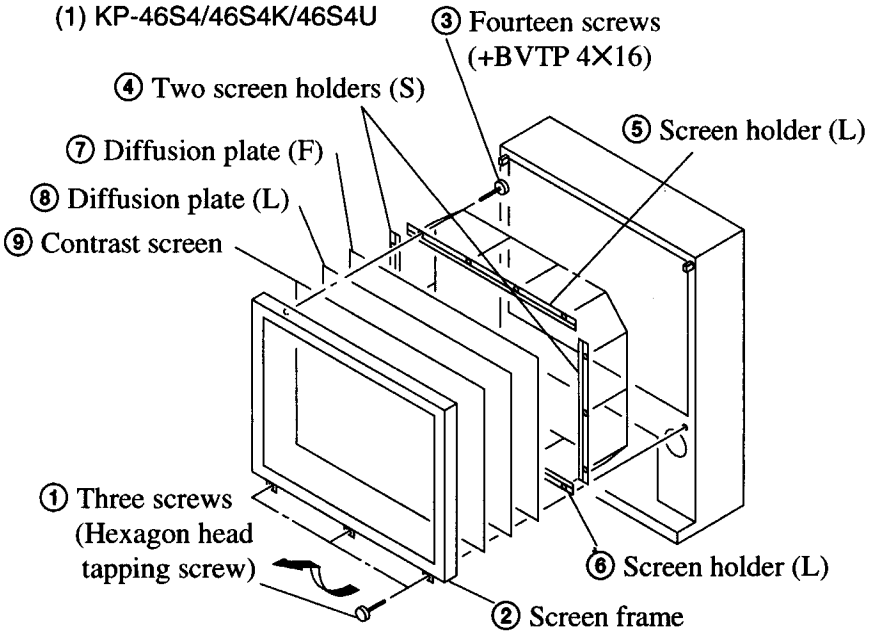


2-1-7. HA AND HB BOARDS REMOVAL

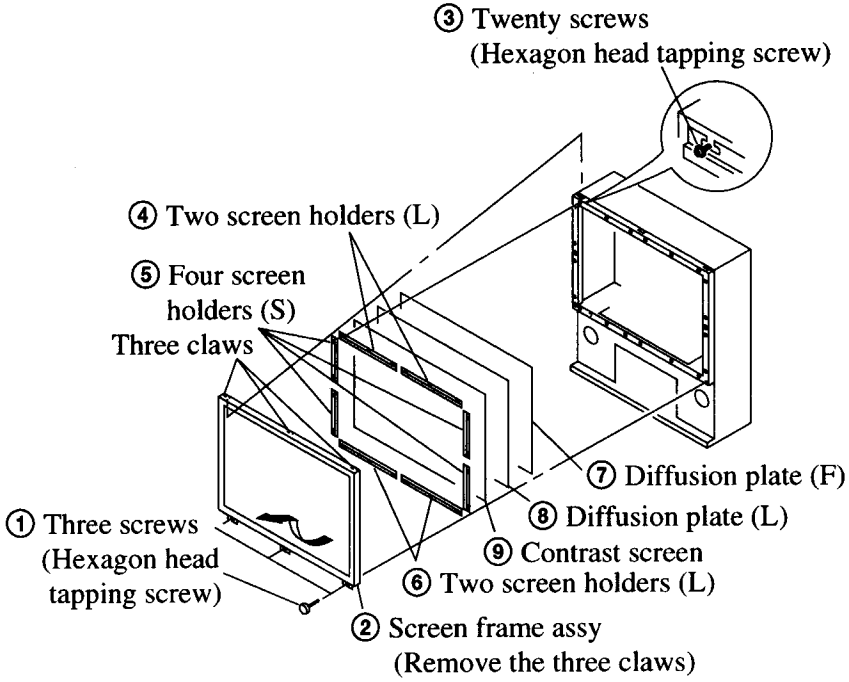


2-1-8. BEZNET ASSY REMOVAL

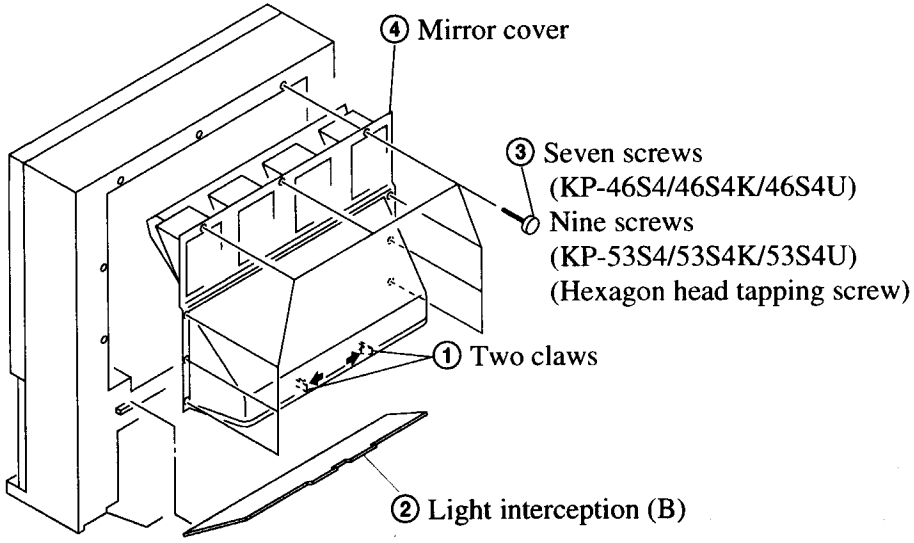
(1) KP-46S4/46S4K/46S4U



(2) KP-53S4/53S4K/53S4U

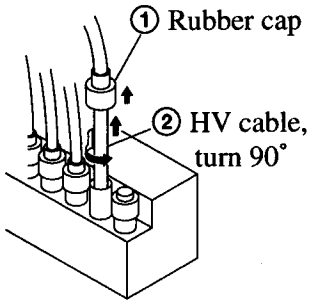


2-1-9. MIRROR COVER ASSY REMOVAL

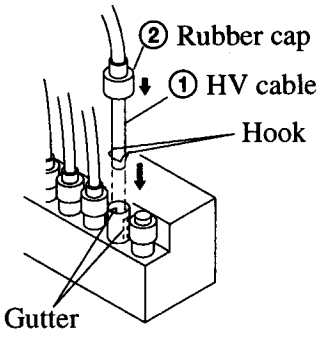


2-1-10. HIGH-VOLTAGE CABLE INSTALLATION AND REMOVAL

(1) Remover



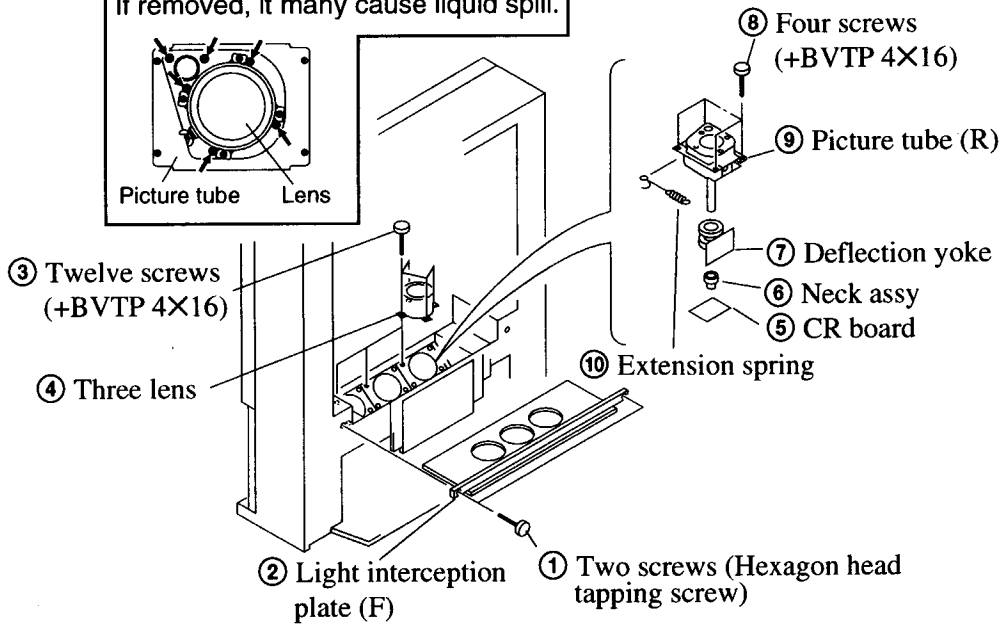
(2) Installation



2-1-11. PICTURE TUBE REMOVAL

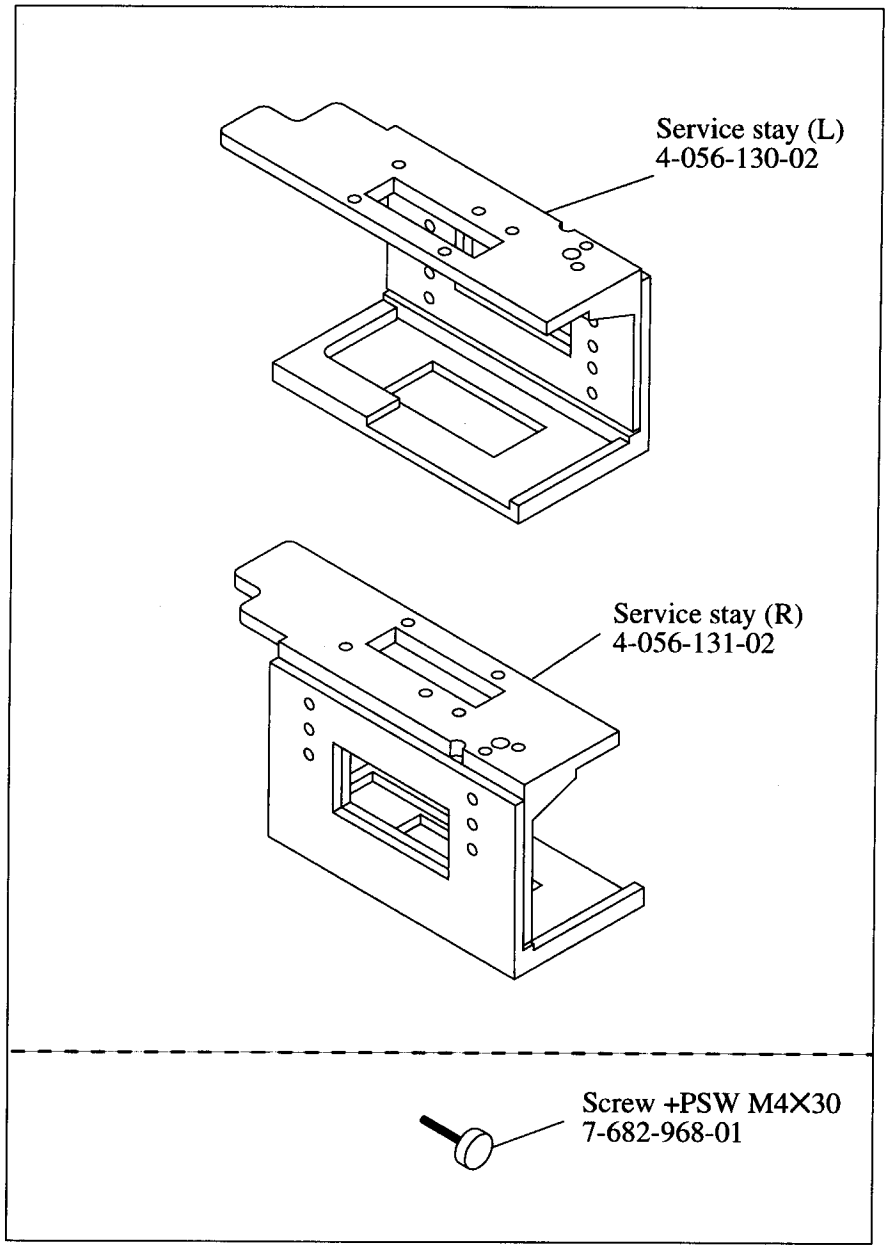
CAUTION

Removing the arrow-marked screws is strictly prohibit.
If removed, it many cause liquid spill.

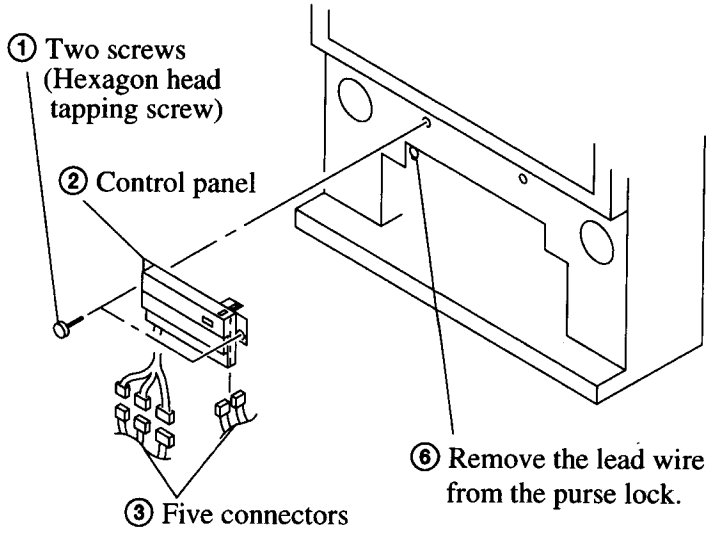


2-2.SERVICE STAY ASSY HOW TO USE AND CARRY BACK SERVICE STAY ASSY

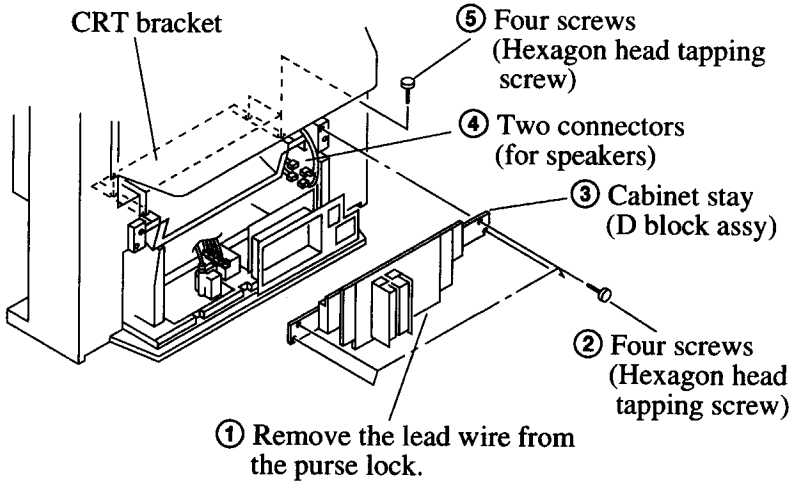
2-2-1. SERVICE STAY ASSY (X-4034-033-2)



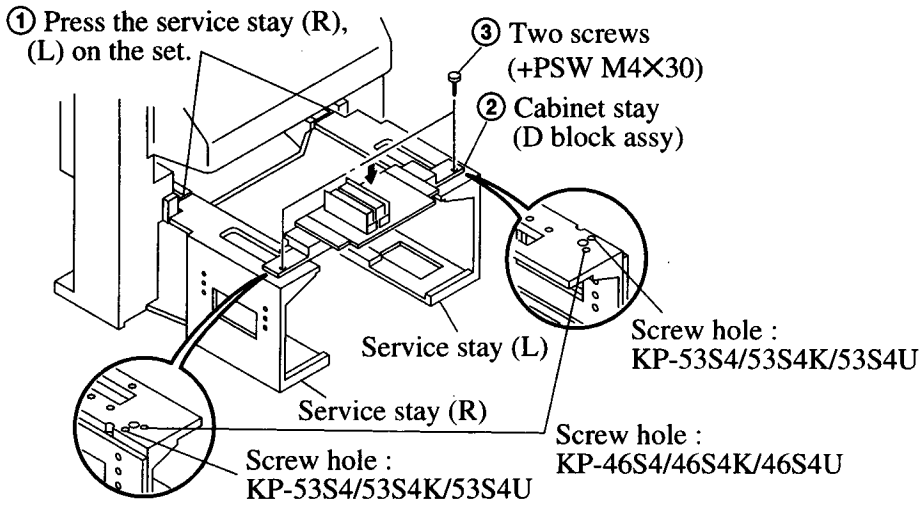
2-2-2.CONTROL PANEL REMOVAL



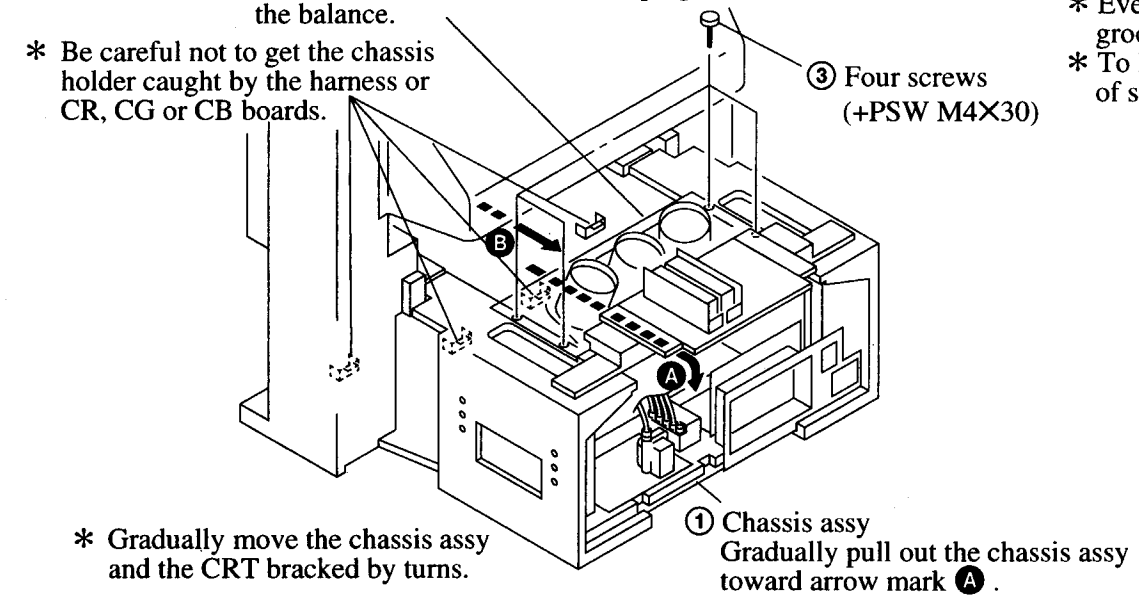
2-2-3. CABINET REMOVAL



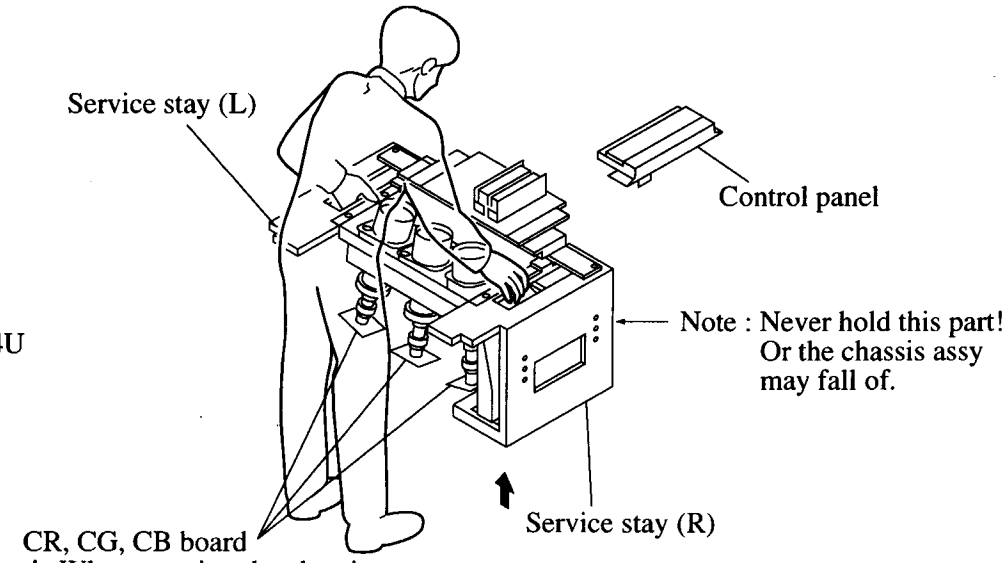
2-2-4. SETTING OF STAY ASSY



2-2-5. INSTALL A CHASSIS ASSY



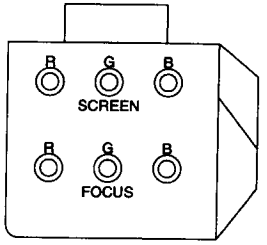
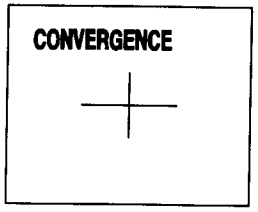
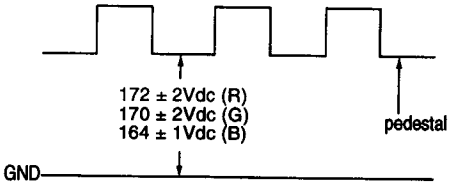
2-2-6. CARRY BACK SERVICE STAY ASSY

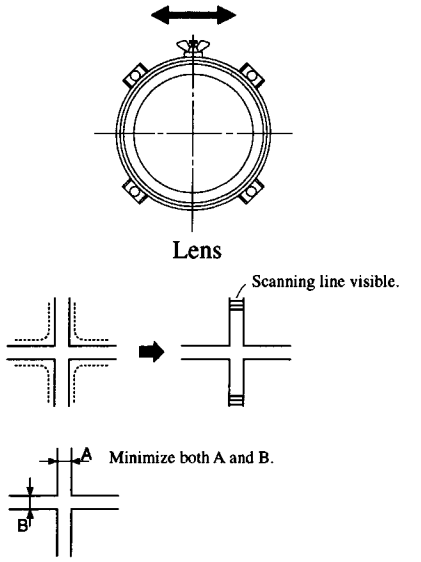
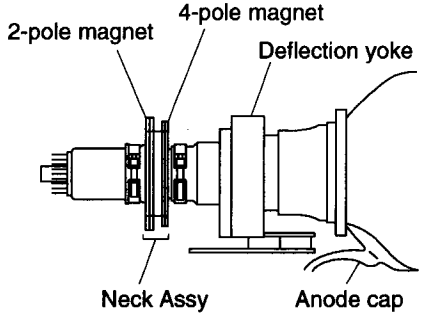


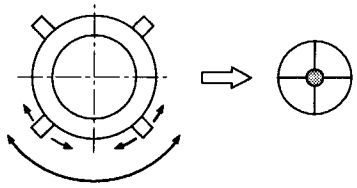
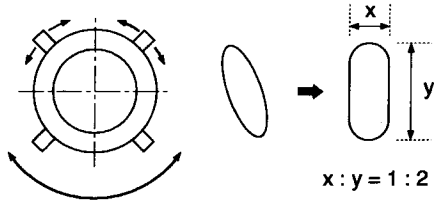
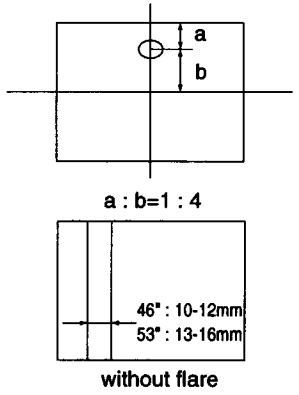
* When carrying the chassis assy, be careful not to touch the CR, CG or CB boards with your legs.

* Even with 2 servicemen, be sure to put your hands into the grooves on the top of service stays (L) and (R) to carry the chassis assy.
* To hold the chassis assy, put your hands into the grooves on the top of service stays (L) and (R).

SECTION 3
SET-UP ADJUSTMENTS

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
SCREEN VOLTAGE ADJUSTMENT (ROUGH ALIGNMENT) 1. Turn the red VR on the FOCUS block all the way to the left and then gradually turn it to the right until the point where you can see the retrace line. 2. Next gradually turn it to the left to the position where the retrace line disappears. **FOCUS LENS ADJUSTMENT** 1. Loosen the lens screw. 2. Set in service mode. 3. Use VSP on the service mode menu to show only the green colour. 4. Press the Commander Menu button and select FEATURES and CONVERGENCE to display the test signal on the screen. 5. Rotate the green lens and align with the optimal focus point from the test signal. 6. Use RRH from the service mode menu to set to green and red. 7. Disply the test signal and rotate the red lens to obtain the optimum focus at the point where the red and green spots overlap. 8. Use RBH from the service mode menu to set to red and blue. 9. Disply the test signal and rotate the blue lens to obtain the optimum focus at the point where the blue and red spots overlap. 10. Tighten the lens screw. **SCREEN (G2) ADJUSTMENT** 1. Select VIDEO mode without signals. 2. Connect an oscilloscope to the TP7103(KR), TP7203(KG) and TP7303(KB) of CR board, CG board and CB board. 3. Adjust R to 172±2Vdc G to 170±2Vdc B to 164±1Vdc by rotating screen VR on the focus block.	Monoscope Pattern		PICTURE ..... minimum BRIGHTNESS .....50% SCREEN (G2)	 FOCUS block  

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
FOCUS VR ADJUSTMENT 1. Set in service mode. 2. Use VSP on the service mode menu to show only the green colour. 3. Press the Commander Menu button (convergence) and output the test signal. 4. Rotate the green VR on the FOCUS block and align to obtain the optimal focus point. 5. Use RRH from the service mode menu to set to green and red. 6. Disply the test signal and rotate the red VR to obtain the optimum focus at the point where the red and green spots overlap. 7. Use RBH from the service mode menu to set to red and blue. 8. Disply the test signal and rotate the blue VR aligning to obtain the optimum focus at the point where the blue and green spots overlap.				
DEFLECTION YOKE TILT ADJUSTMENT 1. Set in service mode. 2. Set to receive the monoscope signal. 3. Use VSP on the service mode menu to show only the green colour. 4. Loosen the deflection yoke set screw and align the tilt of the deflection yoke so that the bars at the centre of the monoscope pattern are horizontal. 5. After aligning the deflection yoke, fasten it securely to the funnel-shaped portion (neck) of the CRT. 6. The tilt of the deflection yoke for red is aligned with RRH on the service mode menu, and the tilt on the deflection yoke for blue is aligned with RBH on the service menu, is aligned the same as was done for green.	Monoscope pattern			

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
2-POLE MAGNET ADJUSTMENT 1. Set in service mode. 2. Set to receive the dot pattern signal. 3. Place the caps on the red and blue lens so that only the green colour is showing. 4. Turn the green VR on the focus block to the right and set to overfocus to enlarge the spot. 5. Now align the 2-Pole Magnet so that the enlarged spot is in the center of the Just Focus spot. 6. Align the green focus VR and set for just (precise) focus. 7. Perform the same alignment for red and blue.	Dot pattern		2-pole magnet	Use the center dot 
4-POLE MAGNET ADJUSTMENT 1. Set in service mode. 2. Set to receive the dot pattern signal. 3. Place the caps on the red and blue lens so that only the green colour is showing. 4. Turn the green VR on the focus block to the left and set to underfocus to enlarge the spot. 5. Now align the 4-Pole Magnet so that the enlarged spot becomes a perfect circle.	Dot pattern		4-pole magnet	Use the center dot 
DEFOCUS ADJUSTMENT 1. Receive the crosshatch signal. 2. Adjust the FOCUS knob so that the crosshatch pattern vertical line width is as in the figure on the right. 3. Blue only defocus Adjustment.	Crosshatch pattern		FOCUS VR • RED • GREEN • BLUE	• Focus adjustment point 

ELECTRICAL ADJUSTMENT BY REMOTE COMMANDER

By using Remote Commander (RM-831),all circuit adjustments can be made.

NOTE : Test Equipment Required.

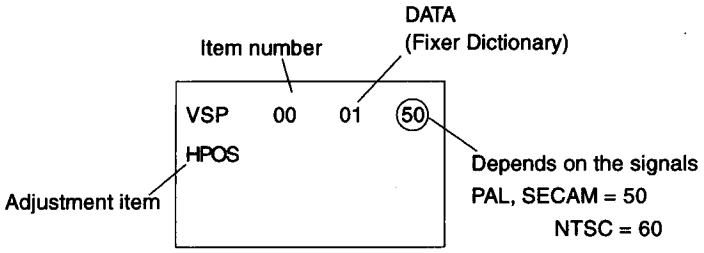
1. Pattern Generator
2. Frequency counter
3. Digital multimeter
4. Audio oscillator

1. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

SERVICE MODE PROCEDURE

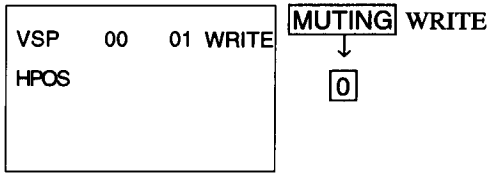
1. Standby mode. (Power off)
2. [DISPLAY] → [5] → [VOL (+)] → [TV POWER] on the Remote Commander.
   ([+] → [5] → ◿ → [ ]) (Press each button within a second.)

SERVICE MODE ADJUSTMENT



3. The CRT displays the item being adjusted.
4. Press [1] or [4] on the Remote Commander to select the item.
5. Press [3] or [6] on the Remote Commander to change the data.
6. If you want to recover the latest values press [7] then [0] to read the memory.
7. Press [MUTING] then [0] to write into memory.

SERVICE ADJUSTMENT MODE MEMORY



8. Press [8] then [0] on the Remote Commander to initialize.
9. Turn set off and on to exit.

2. AFTER IC401 (NON VOLATILE MEMORY) REPLACEMENT

1. Enter to Service Mode.
2. Press [5] and [0] of the commander to initialize data.
3. Adjust standard data to call each item number with [3] and [6] of the commander.
   Write the data per each item number ([MUTING] + [0])
4. Select CP2 items menu and respectively set the data with [3] and [6] of the commander.

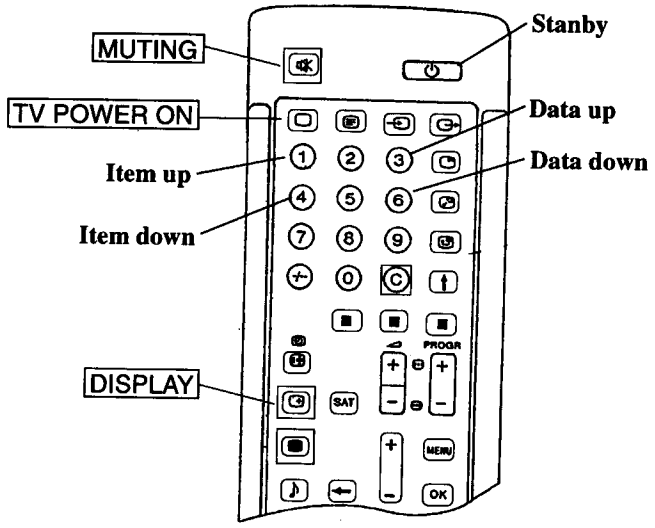
	Item number	Adjustment item	AEP	UK	K (OIRT)
CP2	03	B/G	1	1	1
	04	I	1	1	1
	05	IRE	0	1	0
	06	D/K	1	0	1
	07	AUS	0	0	0
	08	L	1	1	1

   Press [MUTING] + [0] of the commander to write the data.
5. Select item CSET of TXT menu and set the data with [3] and [6] of the commander.

TXT	14	CSET	3 : West (AEP/UK), 5 : EAST(K) 6 : GREEK

   Press [MUTING] + [0] of the commander to write the data.
6. Press [8] and [0] of the commander to make the user control data standard.

3. ADJUST BUTTONS AND INDICATOR



RM-831

4. SERVICE MODE LIST

VSP

	Item number	Adjustment item	Data range	Initial data	Note	Device
VSP	00	HPOS	0 ~ 63	51	H-SHIFT	CXD2018Q
	01	VSIZ	0 ~ 63	24	V-SIZE	
	02	VPOS	0 ~ 63	24	V-SHIFT	
	03	VSCO	0 ~ 15	8	S-CORRECTION	
	04	VLIN	0 ~ 15	10	V-LINEARITY	
	05	HSIZ	0 ~ 63	19	H-SIZE	
	06	HIPN	0 ~ 63	38	PIN-AMP	
	07	HKEY	0 ~ 31	9	TILT	
	08	UPCP	0 ~ 15	7	UPPER CORNER PIN	
	09	LOCP	0 ~ 15	10	LOWER CORNER PIN	
	10	HBOW	0 ~ 15	7	V-BOW	
	11	HSKE	0 ~ 15	9	V-ANGLE	

DP

	Item number	Adjustment item	Data range	Initial data	Note	Device
R GH	00	CENT	–127 ~ +128	20	GREEN. H CENTER	CXP85112B-613S
	01	SKEW	–127 ~ +128	0	GREEN. H SKEW	
	02	BOW	–127 ~ +128	0	GREEN. H BOW	
	03	4BOW	–127 ~ +128	0	GREEN. H 4th BOW	
	04	SIZE	–127 ~ +128	0	GREEN. H SIZE	
	05	LIN	–127 ~ +128	7	GREEN. H LINEARITY	
	06	MSIZ	–127 ~ +128	–5	GREEN. H MIDDLE SIZE	
	07	MLIN	–127 ~ +128	–1	GREEN. H MIDDLE LINEARITY	
	08	KEY	–127 ~ +128	0	GREEN. H KEY	
	09	SSKW	–127 ~ +128	0	GREEN. H SUB SKEW	
	10	MPIN	–127 ~ +128	30	GREEN. H MIDDLE PIN	
	11	PIN	–127 ~ +128	0	GREEN. H PIN	
	12	SBOW	–127 ~ +128	0	GREEN. H SUB BOW	
	13	MBOW	–127 ~ +128	0	GREEN. H MIDDLE BOW	
	14	4PIN	–127 ~ +128	–3	GREEN. H 4th PIN	
	15	4SBOW	–127 ~ +128	0	GREEN. H 4th SUB BOW	
R GV	00	CENT	–127 ~ +128	0	GREEN. V CENTER	CXP85112B-613S
	01	SKEW	–127 ~ +128	0	GREEN. V SKEW	
	02	BOW	–127 ~ +128	2	GREEN. V BOW	
	03	SIZE	–127 ~ +128	0	GREEN. V SIZE	
	04	LIN	–127 ~ +128	4	GREEN. V LINEARITY	
	05	MSIZ	–127 ~ +128	0	GREEN. V MIDDLE SIZE	
	06	MKEY	–127 ~ +128	0	GREEN. V MIDDLE KEY	
	07	KEY	–127 ~ +128	10	GREEN. V KEY	
	08	SSKW	–127 ~ +128	0	GREEN. V SUB SKEW	
	09	MPIN	–127 ~ +128	25	GREEN. V MIDDLE PIN	
	10	PIN	–127 ~ +128	–20	GREEN. V PIN	
	11	SBOW	–127 ~ +128	–2	GREEN. V SUB BOW	
	12	WAVE	–127 ~ +128	0	GREEN. V WAVE	
	13	4PIN	–127 ~ +128	10	GREEN. V 4th PIN	
R RH	00	CENT	–127 ~ +128	–30	RED. H CENTER	CXP85112B-613S
	01	SKEW	–127 ~ +128	0	RED. H SKEW	
	02	BOW	–127 ~ +128	0	RED. H BOW	
	03	4BOW	–127 ~ +128	0	RED. H 4th BOW	
	04	SIZE	–127 ~ +128	0	RED. H SIZE	
	05	LIN	–127 ~ +128	–10	RED. H LINEARITY	
	06	MSIZ	–127 ~ +128	–5	RED. H MIDDLE SIZE	
	07	MLIN	–127 ~ +128	–5	RED. H MIDDLE LINEARITY	
	08	KEY	–127 ~ +128	–5	RED. H KEY	
	09	SSKW	–127 ~ +128	0	RED. H SUB SKEW	
	10	MPIN	–127 ~ +128	30	RED. H MIDDLE PIN	
	11	PIN	–127 ~ +128	10	RED. H PIN	

	Item number	Adjustment item	Data range	Initial data	Note	Device
RRH	12	SBOW	–127 ~ +128	30	RED. H SUB BOW	CXP85112B-613S
	13	MBOW	–127 ~ +128	3	RED. H MIDDLE BOW	
	14	4PIN	–127 ~ +128	–3	RED. H 4th PIN	
	15	4SBOW	–127 ~ +128	–2	RED. H 4th SUB BOW	
R RV	00	CENT	–127 ~ +128	10	RED. V CENTER	CXP85112B-613S
	01	SKEW	–127 ~ +128	0	RED. V SKEW	
	02	BOW	–127 ~ +128	2	RED. V BOW	
	03	SIZE	–127 ~ +128	0	RED. V SIZE	
	04	LIN	–127 ~ +128	0	RED. V LINEARITY	
	05	MSIZ	–127 ~ +128	0	RED. V MIDDLE SIZE	
	06	MKEY	–127 ~ +128	10	RED. V MIDDLE KEY	
	07	KEY	–127 ~ +128	10	RED. V KEY	
	08	SSKW	–127 ~ +128	0	RED. V SUB SKEW	
	09	MPIN	–127 ~ +128	25	RED. V MIDDLE PIN	
	10	PIN	–127 ~ +128	5	RED. V PIN	
	11	SBOW	–127 ~ +128	–2	RED. V SUB BOW	
	12	WAVE	–127 ~ +128	15	RED. V WAVE	
	13	4PIN	–127 ~ +128	10	RED. V 4th PIN	
R BH	00	BSEL	0 / 1	0	RESISTRATION μ CON BSEL	CXP85112B-613S
	01	CENT	–127~ +128	30	BLUE. H CENTER	
	02	SKEW	–127 ~ +128	0	BLUE. H SKEW	
	03	BOW	–127 ~ +128	0	BLUE. H BOW	
	04	4BOW	–127 ~ +128	0	BLUE. H 4th BOW	
	05	SIZE	–127 ~ +128	–1	BLUE. H SIZE	
	06	LIN	–127 ~ +128	–10	BLUE. H LINEARITY	
	07	MSIZ	–127 ~ +128	–5	BLUE. H MIDDLE SIZE	
	08	MLIN	–127 ~ +128	5	BLUE. H MIDDLE LINEARTIY	
	09	KEY	–127 ~ +128	0	BLUE. H KEY	
	10	SSKW	–127 ~ +128	0	BLUE. H SUB SKEW	
	11	MPIN	–127 ~ +128	30	BLUE. H MIDDLE PIN	
	12	PIN	–127 ~ +128	0	BLUE. H PIN	
	13	SBOW	–127 ~ +128	–30	BLUE. H SUB BOW	
	14	MBOW	–127 ~ +128	–3	BLUE. H MIDDLE BOW	
	15	4PIN	–127 ~ +128	–3	BLUE. H 4th PIN	
	16	4SBOW	–127 ~ +128	2	BLUE. H 4th SUB BOW	
R BV	00	CENT	–127 ~ +128	0	BLUE. V CENTER	CXP85112B-613S
	01	SKEW	–127 ~ +128	0	BLUE. V SKEW	
	02	BOW	–127 ~ +128	2	BLUE. V BOW	
	03	SIZE	–127 ~ +128	–10	BLUE. V SIZE	
	04	LIN	–127 ~ +128	0	BLUE. V LINEARITY	
	05	MSIZ	–127 ~ +128	0	BLUE. V MIDDLE SIZE	
	06	MKEY	–127 ~ +128	–10	BLUE. V MIDDLE KEY	

	Item number	Adjustment item	Data range	Initial data	Note	Device
R BV	07	KEY	–127 ~ +128	0	BLUE. V KEY	CXP85112B-613S
	08	SSKW	–127 ~ +128	0	BLUE. V SUB SKEW	
	09	MPIN	–127 ~ +128	25	BLUE. V MIDDLE PIN	
	10	PIN	–127 ~ +128	0	BLUE. V PIN	
	11	SBOW	–127 ~ +128	10	BLUE. V SUB BOW	
	12	WAVE	–127 ~ +128	–15	BLUE. V 3th WAVE	
	13	4PIN	–127 ~ +128	10	BLUE. V 4th PIN	

D/A

	Item number	Adjustment item	Data range	Initial data	Note	Device
D/A	00	BKU	0 ~ 63	63	V.BLK UP-SIDE	CXA1315PM
	01	BKD	0 ~ 63	0	V.BLK DOWN-SIDE	

MCD

	Item number	Adjustment item	Data range	Initial data	Note	Device
MCD	00	MHUE	0 ~ 31	15	SUB HUE OF MAIN PICTURE	TDA9141
	01	YDLT	0 ~ 15	7	Y DELAY	TDA9143

SCD

	Item number	Adjustment item	Data range	Initial data	Note	Device
SCD	00	SHUE	0 ~ 31	15	SUB HUE OF SUB PICTURE	TDA9160

RGB

	Item number	Adjustment item	Data range	Initial data	Note	Device
RGB	00	SCOL	0 ~ 15	4	SUB COLOUR	TDA4780
	01	SBRT	0 ~ 63	27	SUB BRIGHT	
	02	RAMP	0 ~ 63	31	RED GAIN	
	03	GAMP	0 ~ 63	31	GREEN GAIN	
	04	BAMP	0 ~ 63	31	BLUE GAIN	
	05	RCUT	0 ~ 63	31	RED LEVEL REFERENCE	
	06	GCUT	0 ~ 63	31	GREEN LEVEL REFERENCE	
	07	BCUT	0 ~ 63	31	BLUE LEVEL REFERENCE	
	08	PDL	0 ~ 63	31	PEAK DRIVE LIMITER	
	09	GNMA	0 ~ 63	0	GAMMA	
	10	ADBL	0 / 1	0	ADAPTIVE BLACK	
	11	RELC	0 / 1	1	RELATIVE TO CUT-OFF	
	12	TCPL	0 / 1	1	TIME CONSTANT PEAK DRIVE LIMITER	

PIP

	Item number	Adjustment item	Data range	Initial data	Note	Device
PIP	00	RDV	0 ~ 15	8	V READ DELAY	SDA9188-3X
	01	RDH	0 ~ 63	16	H READ DELAY	
	02	FRY	0 ~ 15	3	BRIGHTNESS OF THE BORDER FRAME	
	03	9V50	0 ~ 7	3	MULTI PIP V 50Hz	
	04	9H50	0 ~ 7	2	MULTI PIP H 50Hz	
	05	9V60	0 ~ 7	2	MULTI PIP V 60Hz	
	06	9H60	0 ~ 7	3	MULTI PIP H 60Hz	
	07	SCON	0 ~ 15	8	CONTRAST D/A CONVERTER	

IPQ

	Item number	Adjustment item	Data range	Initial data	Note	Device
IPQ	00	CIN	0 / 1	0	CINE MODE (ABAB RASTER) OFF/ON	83C652
	01	107	0 / 1	1	MEMORY CONFIGURATION TMS4C2972 SWITCH	
	02	LFR	0 / 1	1	LINE FLICKER REDUCTION MODE OFF/ON	
	03	HWE	0 ~ 15	15	HWE 1 LINE DEALY OFF SET TO DEFAULT	
	04	NR	0 ~ 3	2	NOISE REDUCTION LEVEL	
	05	Y-V	0 ~ 255	60	Y-VALUE (BRIGHTNESS)	
	06	UV-V	0 ~ 255	0	UV-VALUE (COLOUR)	
	07	PEAK	0 ~ 127	10	PEAKING	
	08	CTI	0 ~ 127	64	CTI LEVEL DATA	
	09	VWE	0 ~ 63	31	VWE1 DELAY	

TXT

	Item number	Adjustment item	Data range	Initial data	Note	Device
TXT	00	TXH	0 ~ 255	9	H START POSITION	TPU3040/TPU3041
	01	TXV	0 ~ 63	44	V START POSITION	
	02	VSP	0 ~ 255	59	V STOP POSITION	
	03	BSP	0 ~ 255	61	BLANKING STOP	
	04	BST	0 ~ 255	53	BLANKING START	
	05	QSF	0 ~ 31	1	ACQUSITION SOFT SLICER	
	06	A7F	0 ~ 255	10	VALUE OF ADRESS 007FH	
	07	QDT	0 ~ 63	13	ACQUSITION DATA SLICER	
	08	CST	0 ~ 255	0	CLAMPING START	
	09	CSP	0 ~ 255	80	CLAMPING STOP	
	10	LMT	0 / 1	0	LIMIT SLICER ADAPTION SW	
	11	GMX	0 ~ 255	31	GAIN MAX	
	12	FMX	0 ~ 255	31	FILTER MAX	
	13	TVER	0 ~3	3	TPU VERSION (TC2023)	
	14	CSET	0 ~7	3	TELETEXT LANGUAGE SETTING 3: WEST (AEP/UK) 5: EAST (K), 6: GREEK	

AP

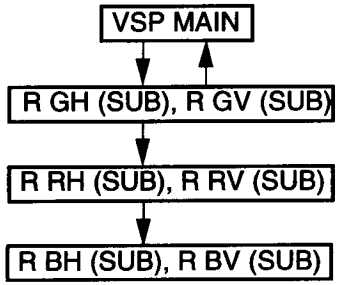
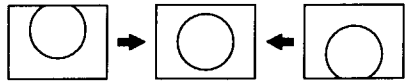
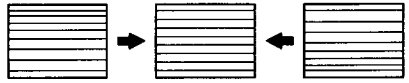
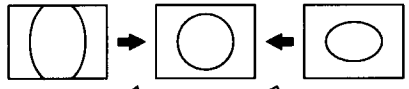
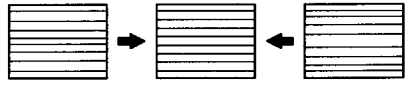
	Item number	Adjustment item	Data range	Initial data	Note	Device
AP	00	FAW	0 ~ 255	10	NICAM FAW THRESHOLD	MSP3410
	01	CTM	0 ~ 255	4	NICAM ERROR BIT THRESHOLD(MONO→NICAM)	
	02	CTN	0 ~ 255	80	NICAM ERROR BIT THRESHOLD(NICAM→MONO)	
	03	WGO	0 ~ 255	10	WEST GERMAN STEREO LOW THRESHOLD	
	04	WGS	0 ~ 255	21	WEST GERMAN STEREO HIGH THRESHOLD	
	05	WGT	0 ~ 255	80	WEST GERMAN STEREO LOW 2 THRESHOLD	
	06	WGB	0 ~ 255	250	WEST GERMAN STEREO HIGH 2 THRESHOLD	
	07	ACG	0 / 1	1	AGC AUTO / CONSTANT SWITCH	
	08	CDB	0 ~ 63	30	AGC GAIN VALUE AT CONSTANT MODE	
	09	FMP	0 ~ 127	26	FM MONO PRESCALE	
	10	WGP	0 ~ 127	26	WEST GERMAN STEREO PRESCALE	
	11	INIP	0 ~ 127	127	I NICAM PRESCALE	
	12	BNIP	0 ~ 127	72	B/G NICAM PRESCALE	
	13	LNIP	0 ~ 127	81	L NICAM PRESCALE	
	14	DNIP	0 ~ 127	72	D/K NICAM PRESCALE	
	15	CRM	0 / 1	0	CARRIER MUTE FUNCTION	
	16	ACO	0 / 1	1	AUDIO CLOCK OUT OFF/ON	
	17	WAC	0 ~ 15	1	WEST GERMAN STEREO JUDGE CONSTANT	

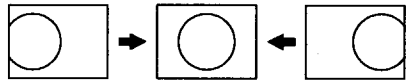
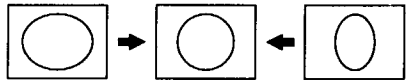
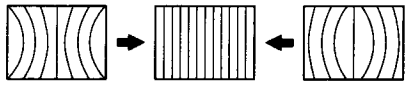
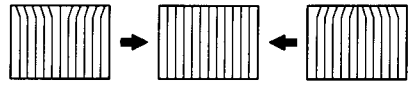
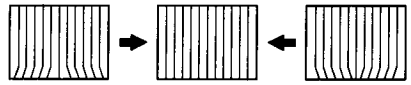
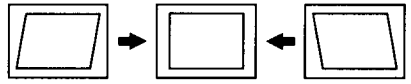
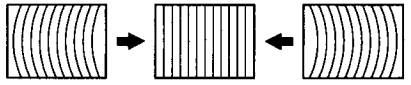
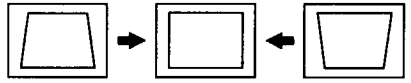
CPU

	Item number	Adjustment item	Data range	Initial data	Note	Device
CPU	00	OSH	0 ~ 63	18	OSD H POSITION	CXP85460
	01	ODL	0 ~ 256	15	POWER ON DELAY	
	02	FTZP	0 / 1	1	FTZ MUTE PRIORITY	
	03	RGBP	0 / 1	0	RGB MODE PRIORITY	
	04	NICP	0 / 1	1	NICAM PRIORITY	
	05	B/G	0 / 1	1	TV SYSTEM B/G OFF/ON	
	06	I	0 / 1	1	TV SYSTEM I OFF/ON	
	07	IRE	0 / 1	0	TV SYSTEM IRE OFF/ON	
	08	D/K	0 / 1	1	TV SYSTEM D/K OFF/ON	
	09	AUS	0 / 1	0	TV SYSTEM AUS OFF/ON	
	10	L	0 / 1	1	TV SYSTEM L OFF/ON	
	11	MYC 2	0 / 1	0	YC2/AV2 PRIORITY	
	12	MYC 4	0 / 1	0	YC4/AV4 PRIORITY	

IP 2

	Item number	Adjustment item	Data range	Initial data	Note	Device
IP2	00	BOX	0 / 1	0	BOX FUNCTION SWITCH	TDA9160
	01	SCF	0 ~ 3	0	SCREEN FADE FUNCTION	
	02	SPS	0 ~ 3	0	SPLIT SCREEN FUNCTION	
	03	PHAS	0 / 1	0	PHASE FLAG	
	04	AXIS	0 / 1	1	RGB AXIS	
	05	HSFT	0 ~ 31	10	H. SHIFT ADJUSTMENT	
	06	SFTE	0 / 1	1	PICTURE SHIFT ENABLE	
	07	SFTF	0 / 1	0	PICTURE SHIFT FACTORY CHECK	
	08	3BCN	0 ~ 255	10	BINARY BIT CHECK FOR TELETEXT	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
CONVERGENCE ADJUSTMENT ●When replacing the deflection yoke, always perform "DEFLECTION YOKE TILT ADJUSTMENT" before adjusting the convergence. Adjustment procedure  				
• GREEN REGISTRATION ADJUSTMENT			<VSP MENU>	
• V-SHIFT adjustment	Monoscope pattern or Crosshatch pattern		VSP VPOS	VPOS 
• V-LINEARITY adjustment			VSP VLIN	VLIN 
• V-SIZE, V-CORRECTION adjustment While tracking, adjust so that the lattice intervals for VSIZ and VSCO are equal.			VSP VSIZ VSP VSCO	VSIZ  VSCO 

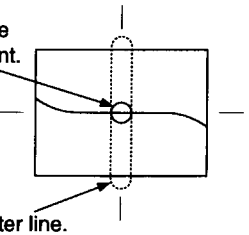
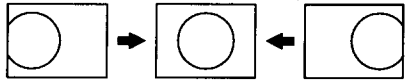
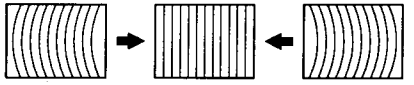
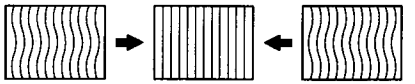
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
• H-SHIFT adjustment			VSP HPOS	HPOS 
• H-SIZE adjustment Finely adjust with SUB MSIZ.			VSP HSIZ	HSIZ 
• PIN-AMP adjustment Finely adjust with SUB MPIN.			VSP HPIN	HPIN 
• UPPER/LOWER-CORNER PIN adjustment Correct the screens top and bottom bow line. However, if this adjustment is overdone, distortion may occur with the PIN-AMP adjustment that can not be re-adjusted. Note : The PIN-AMP adjusts the overall screen from top to bottom, but the UPPER/LOWER-CORNER PIN adjustments have large movement in the top and bottom sections, so be careful.			VSP UPCP VSP LOCP	UPCP  LOCP 
• V-ANGLE, V-BOW adjustment Correct the tilt and bow of the vertical line at the center of the screen.			VSP HSKE VSP HBOW	HSKE  HBOW 
• TILT adjustment Adjust to eliminate the tilt of one of the two vertical lines at both ends of the screen.			VSP HKEY	HKEY 

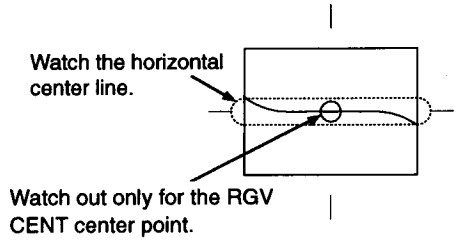
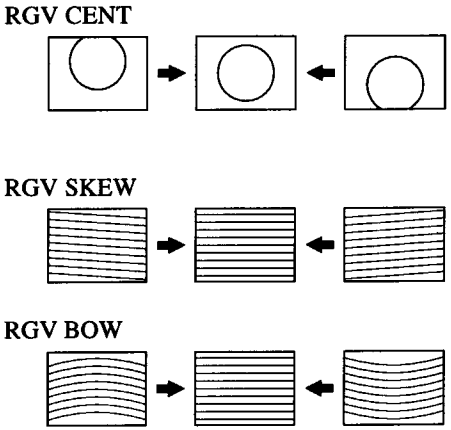
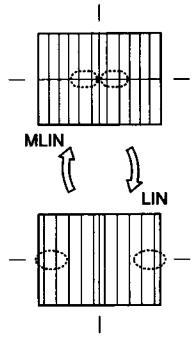
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER

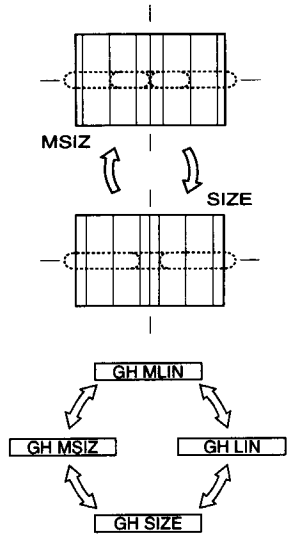
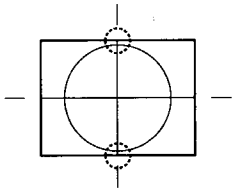
CONVERGENCE SUB ADJUSTMENT

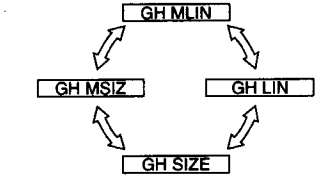
Adjustment O : Yes – : No

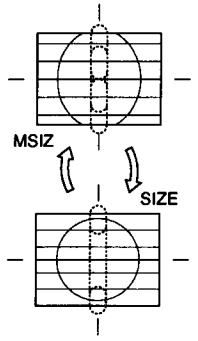
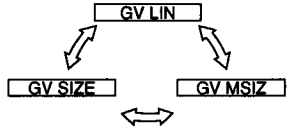
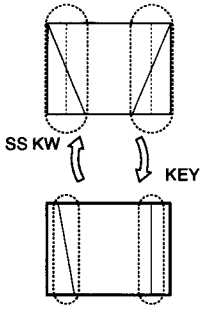
Display	Adjustment item	Adjustment type					
		RGH	RGV	RRH	RRV	RBH	RBV
BSEL	COL SELECT	–	–	–	–	O	–
CENT	CENT	O	O	O	O	O	O
SKEW	SKEW	O	O	O	O	O	O
BOW	BOW	O	O	O	O	O	O
4BOW	4TH BOW	O	–	O	–	O	–
SIZE	SIZE	O	O	O	O	O	O
LIN	LIN	O	O	O	O	O	O
MSIZ	MID SIZE	O	O	O	O	O	O
MLIN	MID LIN	O	O	O	–	O	–
MKEY	MID KEY	–	O	–	O	–	O
KEY	KEY	O	O	O	O	O	O
SSKW	SUB SKEW	O	O	O	O	O	O
M PIN	MID PIN	O	O	O	O	O	O
PIN	PIN	O	O	O	O	O	O
SBOW	SUB BOW	O	O	O	O	O	O
WAVE	WAVE	–	O	–	O	–	O
MBOW	MID BOW	O	–	O	–	O	–
4PIN	4TH PIN	O	O	O	O	O	O
4SBOW	4TH SUB BOW	O	–	O	–	O	–

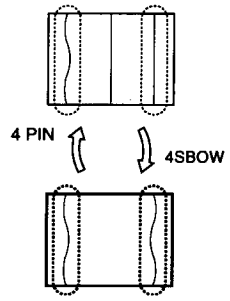
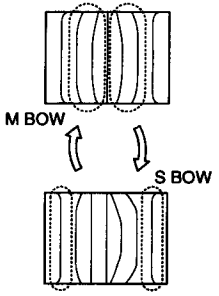
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
• GREEN SUB ADJUSTMENT **SCREEN CENTER SECTION GREEN VERTICAL LINE ADJUSTMENT** 1. Finely adjust with RGH CENT, RGH BOW, RGH SKEW. Adjust by watching out for the RGH CENT screen center section.			<RGH MENU> RGH CENT RGH BOW RGH SKEW	Watch out only for the GH CENT center point.  Watch the vertical center line. RGH CENT  RGH BOW  RGH SKEW
2. RGH 4TH BOW adjustment Correct the corner distortion that could not be adjusted away with the RGH 4BOW adjustment.			RGH 4BOW	RGH 4BOW 

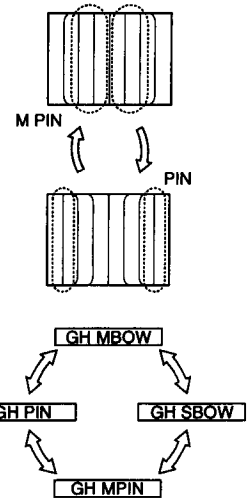
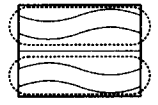
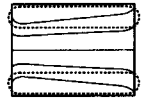
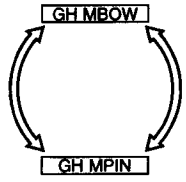
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
SCREEN CENTER SECTION GREEN HORIZONTAL LINE ADJUSTMENT 1. Finely adjust the center position of the vertical line at the center of the screen with RGV CENT.			<RGV MENU> RGV CENT	
2. Correct the tilt and bow of the horizontal line at the center of the screen with RGV SKEW and RGV BOW.			RGV SKEW RGV BOW	
GREEN SIZE AND LINEARITY ADJUSTMENT 1. Balance the sizes at both sides of the center section of the screen with RGH MLIN. 2. Balance the sizes on both end sections of the screen with RGH LIN. 3. While tracking, adjust with RGH MLIN and RGH LIN so that the sizes of the horizontal line at the center of the screen are symmetrical left and right.			<RGH MENU> RGH MLIN RGH LIN	

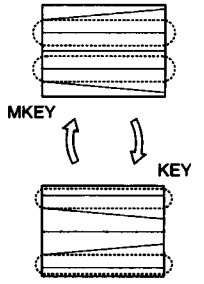
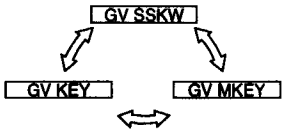
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN HORIZONTAL SIZE ADJUSTMENT 1. Adjust with RGH MSIZE so that the sizes of both ends and of both sides of the center section of the screen are equal. 2. Adjust with RGH SIZE so that the horizontal sizes of both ends and of both sides of the center section of the screen are equal. 3. While tracking, adjust with RGH MSIZ and RGH SIZE so that the lattice intervals for the horizontal line section of the center section of the screen are equal and so that the horizontal size is the prescribed value. 4. If M LIN is changed when the RGH MSIZ and RGH SIZE adjustment is complete, adjust again while tracking. ●With just the H SIZE adjustment in MAIN, if there is no need to adjust RGH SIZE in SUB this can save power.			<RGH MENU> RGH MSIZ RGH SIZE	
GREEN VERTICAL LINEARITY ADJUSTMENT 1. Adjust RGV LIN so that the vertical lines at the top and bottom of the screen are symmetrical.			<RGV MENU> RGV LIN	

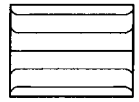
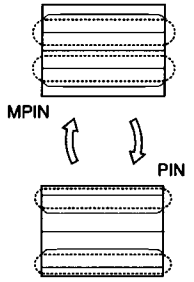
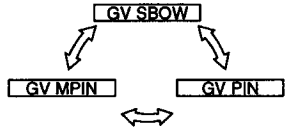


ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN VERTICAL SIZE ADJUSTMENT 1. Adjust with RGV MSIZE so that the sizes for the top and bottom sections of the screen and for both sides of the center section of the screen are equal. 2. Set the vertical size to the prescribed value with RGV SIZE. 3. Adjust RGV MSIZ and RGV SIZE watching the vertical line at the center section of the screen. 4. While tracking, adjust with RGV MSIZ and RGV SIZE so that the lattice intervals for the vertical line section of the center section of the screen are equal and so that the vertical size is the regulation value. 5. If RGV LIN is out of place when the RGV MSIZ and RGV SIZE adjustment is complete, adjust again while tracking. ●If there is no need to adjust RGV SIZE in SUB with just the V SIZE adjustment in MAIN, this can save power.			<RGV MENU> RGV MSIZ RGV SIZE	 
GREEN HORIZONTAL TRAPEZOIDAL DISTORTION ADJUSTMENT 1. Adjust with RGH SSKW so that the tilt of the vertical lines at both ends of the screen is symmetrical left and right. 2. Adjust with RGH KEY so that there is no tilt in the vertical lines at both ends of the screen. 3. If there is a tilt on either the left or right after the RGH KEY adjustment, adjust while tracking.			<RGV MENU> RGH SSKW RGH KEY	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN HORIZONTAL QUATERNARY ADJUSTMENT 1. Correct the quaternary distortion with RGH 4PIN. 2. While balancing, correct the quaternary distortion of both end sections of the screen with RGH 4SBOW. 3. While tracking, adjust with RGH 4PIN and RGH 4SBOW.			<RGH MENU> RGH 4PIN RGH 4SBOW	
GREEN HORIZONTAL ASYMMETRICAL PIN DISTORTION ADJUSTMENT 1. Adjust with RGH MBOW so that the pin asymmetry at both sides of the center section of screen is symmetrical. 2. Adjust with RGH SBOW so that the bow at both end sections of the screen is symmetrical left and right. 3. While tracking, adjust with RGH MBOW and RGH SBOW so that the bow of vertical lines on the entire screen is symmetrical left and right.			<RGH MENU> RGH MBOW RGH SBOW	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN HORIZONTAL SYMMETRICAL PIN DISTORTION ADJUSTMENT 1. Adjust the pin distortion at both sides of the center section of the screen with RGH MPIN. 2. Adjust the pin distortion at both end sections of the screen with RGH PIN. 3. While tracking, adjust with RGH MPIN and RGH PIN so that the PIN of vertical lines on the entire screen have no bowing. 4. If there is asymmetrical pin distortion after the RGH MPIN and RGH PIN adjustments, adjust with RGH MBOW and RGH SBOW while tracking. ●With just the PIN AMP adjustment in MAIN, if there is no need to adjust RGV PIN in SUB, this can save power.			<RGH MENU> RGH MPIN RGH PIN RGH MBOW RGH SBOW	
GREEN VERTICAL WAVE (TERTIARY DISTORTION) ADJUSTMENT 1. Take the screen top and bottom horizontal lines with RGV WAVE and find the secondary and quaternary waveform. 2. There is KEY distortion after the RGV WAVE adjustment, so adjust with RGV WAVE and RGV KEY while tracking.			<RGV MENU> RGV WAVE RGV KEY	RGV WAVE  RGV KEY  

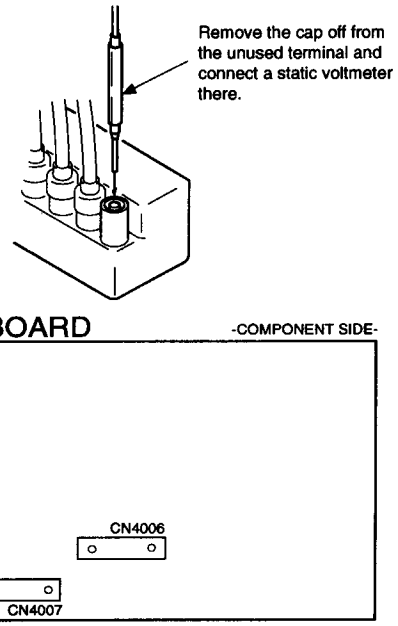
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN VERTICAL QUATERNARY DISTORTION ADJUSTMENT 1. Correct the quaternary distortion of the horizontal lines at the top and bottom sections of the screen with RGV 4PIN. 1) Since there is no 4SBOW for vertical correction, there will be a slight imbalance, but adjust to eliminate the distortion from the horizontal line at either the top or the bottom of the screen. 2) In many cases, the horizontal lines at the top and bottom sections of the screen are not straight lines after the adjustment. As long as the secondary distortion is mild enough that it can be corrected with the PIN adjustment, this is OK.			<RGV MENU> RGV 4PIN	RGV 4PIN
GREEN VERTICAL TRAPEZOIDAL DISTORTION ADJUSTMENT 1. Adjust with RGV SSKW so that the tilt of the horizontal lines at the top and bottom sections of the screen is symmetrical about the center position horizontal line. 2. Adjust with RGV MKEY so that there is no tilt for the line sections at both sides of the horizontal lines at the center section of the stream. 3. Adjust with RGV KEY so that there is no tilt for the horizontal lines at the top and bottom sections of the screen. 4. While tracking, adjust with RGV MKEY and RGV KEY so that there is no tilt for the horizontal lines on the entire screen. 5. If the tilt is unbalanced after the RGV MKEY and RGV KEY adjustment, adjust again with RGV SSKW.			<RGV MENU> RGV SSKW RGV MKEY RGV KEY RGV SSKW	RGV SSKW  

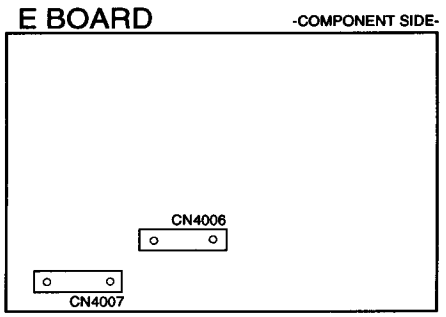
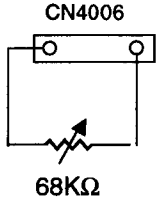
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN VERTICAL ASYMMETRICAL PIN DISTORTION (SECONDARY DISTORTION) ADJUSTMENT 1. Correct the asymmetrical pin distortion at the top and bottom sections of the screen with RGV SBOW.			<RGV MENU> RGV SBOW	RGV SBOW 
GREEN VERTICAL ASYMMETRICAL PIN DISTORTION ADJUSTMENT 1. Adjust the pin distortion for both side sections and the center of the screen with RGV MPIN. 2. Adjust with RGV PIN so that the horizontal lines at the top and bottom sections of the screen are straight lines. 3. Adjust with RGV MPIN and RGV PIN so that there is no curve in the horizontal lines on the entire screen.			<RGV MENU> RGV MPIN RGV PIN	
4. After the adjustments in Items 1-3, adjust the tracking with RGV SBOW, RGV MPIN, and RGV PIN.			RGV SBOW	

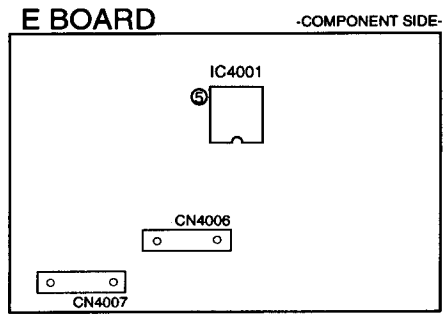
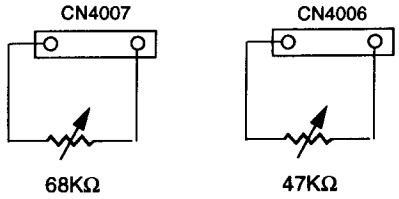
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN AND RED REGISTRATION ADJUSTMENT (RRH, RRV) 1. Receive a PAL cross-hatch signal. 2. Adjust so that the red lines lay on the green lines. Adjust with the same procedure as the GREEN SUB adjustment. Notes: 1. The main correction is not carried out during red registration adjustment. 2. Beware. The green adjustment items can be changed by mistake. 3. Unlike for green, adjust within the range -127 ~ +128.	PAL Cross-hatch pattern			
GREEN AND BLUE REGISTRATION ADJUSTMENT (RBH, RBV) 1. Receive a PAL cross-hatch signal. 2. Adjust so that the blue and green lines are on top of each other. Notes : 1. The main correction is not carried out during RED registration adjustment. 2. Beware. The GREEN and RED adjustment items can be changed by mistake.	PAL Cross-hatch pattern			

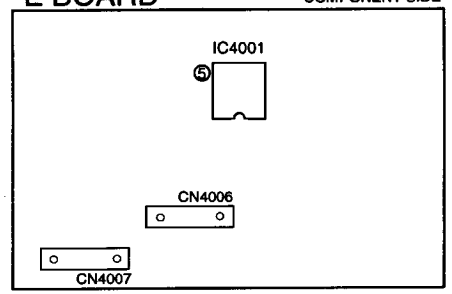
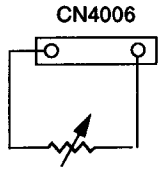
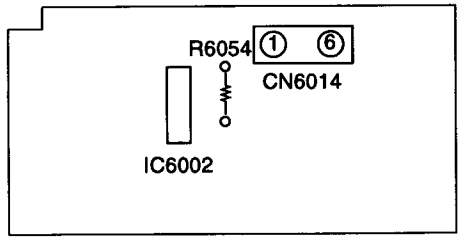
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
AGC ADJUSTMENT 1. Receive an off-air signal. 2.Adjust the AGC VR (IF 1001) so that there is no snow noise and cross-modulation.				
WHITE BALANCE ADJUSTMENT 1. Receive the monoscope pattern signal and adjust the picture quality with the menu. 2. Adjust service mode SBRT so that the signal 10 IRE section barely glows. 3. Receive the all-white pattern signal. 4. Adjust the white balance with service mode GCUT and BCUT. 5. Adjust service mode SBRT so that the signal 100 IRE section barely glows. 6. Adjust the white balance with service mode GAMP and BAMP. 7. Repeatedly adjust the white balance for the minimum and maximum picture settings.	Monoscope pattern All White pattern		PICTURE ..... minimum < RGB MENU > RGB SBRT RGB GCUT RGB BCUT PICTURE ..... minimum RGB GAMP RGB BAMP PICTURE ..... maximum	

SECTION 4
SAFETY RELATED ADJUSTMENTS

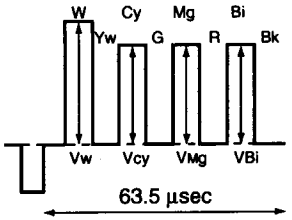
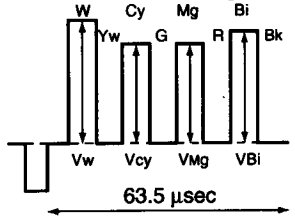
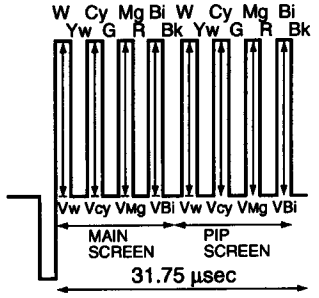
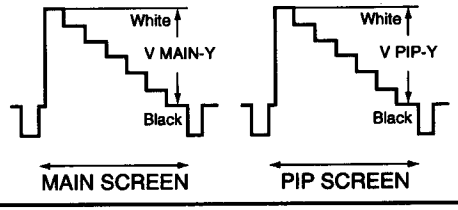
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
[E BOARD] **HV HOLD DOWN CIRCUIT OPERATION CHECK AND ADJUSTMENT** When replacing the following components marked with ◪ on the schematic diagram, always check hold-down voltage and if necessary re-adjust. **OPERATION CHECK** 1. Connect a HV static voltmeter to the unconnected plug of the high-voltage block. 2. Connect a 68kΩ variable resistor, set to maximum value, across CN4006. 3. Power on the set. 4. Receive dot signal pattern. 5. Gradually lower the value of the variable resistor and check that the hold-down circuit operates at a static voltmeter reading of 33.40±0.30kVdc when the raster disappears. **HV HOLD-DOWN ADJUSTMENT** 1. REPART STEPS ① ~ ⑤ as above. 2. Just at the point hold-down circuit begins to operate switch off the set. 3. Remove the VR connected across CN4006, and measure it's resistance. 4. Solder a resistor value, nearest to the measured value, across CN4007. 5. Reconfirm operation check.	HIGH-VOLTAGE Voltmeter Dot pattern	◪ marked parts C4057, D4026, R988, R4019, T4002, T4003 (FBT), E BOARD, HV Block HV Block CN4006 HIGH-VOLTAGE Voltmeter 33.40 ± 0.30kVdc	☒ R988	

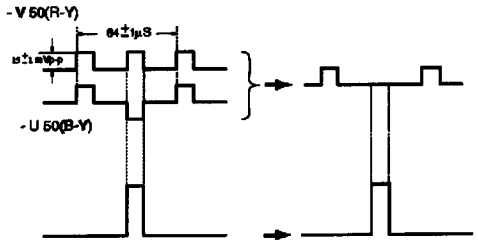
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
HV REGULATION CIRCUIT CHECK AND ADJUSTMENT When replacing the following components marked with ◪ on the schematic diagram always check HV regulation, and if necessary re-adjust. **OPERATION CHECK** 1. Connect a HV static voltmeter to the unconnected plug of the high-voltage block. 2. Power on the set. 3. Receive dot signal pattern. 4. Check that the HV static voltmeter is reading 31.00±0.2kVdc. **HV Regulation adjustment** 1. Repeat step ① as aboue. 2. Connect 68kΩ variable resistor, set to maximum value, to CN4006. 3. Power on the set. 4. Receive dot signal pattern. 5. Gradually lower the value of the variable resistor until the static voltmeter is reading 31.00±0.20kVdc. 6. Switch off the set. 7. Remove the VR connected across CN4006, and measure its value. 8. Solder a resistor value, nearest to the measured value, across CN4006. 9. Reconfirm operation check.	Dot pattern HIGH-VOLTAGE Voltmeter	◪ marked parts C4033, C4034, C4046, C4047, C4049, D4012, D4018, D4023, D4028, D4035, R983, R4022, R4046, R4047, R4048, R4053, R4054, R4057, R4059, R4060, R4061, R4077, R4079, R4086, R4087, R4088, R4091, R4092, R4097, R4098, R4100, Q4013, T4002, T4003 (FBT), E Board, HV Block HIGH-VOLTAGE Voltmeter 31.00 ± 0.20k Vdc CN4006	⊠ R983	 

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
HV HOLD DOWN ADJUSTMENT WITHOUT USING STATIC HIGH VOLTAGE METER It is normally desirable that HV hold down and HV regulation checks uses a high voltage meter. However, sometimes one is not available, for example in the held, below is an adjustment method that can be used. 1. Receive DOT signal (PICTURE : 80%, BRIGHTNESS : 50%). 2. Turn off the power of the projector, and remove ⋈R983 from CN4006 and ⋈R988 from CN4007. 3. Fix a 47kΩ VR onto CN4006 with solder, and set the resistor value at maximum. Fix a 68kΩ VR onto CN4007 with solder, and set the resistor value at minimum. 4. Turn on the power of the projector. Connect a digital voltmeter to IC4001 ⑤ pin. 5. Slowly turn the 47kΩ VR that is soldered to CN4006, and gradually lower the voltage of IC4001 ⑤ pin down to 1.67Vdc. 6. Slowly turn the 68kΩ VR that is soldered to CN4007, and gradually raise the resistor value until the raster disappears and the HV hold down circuit starts operating. 7. Turn off the power of the projector. 8. Remove the 68kΩ VR from CN4007, and measure the resistor value with the digital voltmeter. Put a resistor (metal oxide, 1/4W) that has same value as the measured resistor onto CN4007 and solder it. 9. Set the value of the 47kΩ VR on CN4006 at the maximum. Receive DOT signal (PICTURE : 80%, BRIGHTNESS : 50%). 10. Turn on the power of the projector. 11. Connect a digital voltmeter to IC 4001 ⑤ pin. 12. Slowly turn down the 47kΩ VR that is connected to CN4006 to gradually lower the voltage of IC4001 ⑤ pin between 1.62 to 1.70Vdc, and check if the raster disappears and the hold down circuit operates. 13. Turn off the power of the projector. 14. Remove the 47kΩ VR from CN4006. Put back the removed ⋈ R983 onto CN4006 and solder it again.	Dot pattern Digital voltmeter	IC4001 ⑤ pin	⋈ R983, R988 47kΩ VR ..... maximum 68kΩ VR ..... minimum PICTURE .....80% BRIGHTNESS .....CENTER	 

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
HV REGULATOR ADJUSTMENT WITHOUT USING STATIC HIGH VOLTAGEMETER (⊠R983)			⊠ R983	E BOARD -COMPONENT SIDE- 
1. Receive DOT signal (PICTURE : 80%, BRIGHTNESS : 50%).	Dot signal		PICTURE .....80% BRIGHTNESS .....center	
2. Turn off the power of the projector.				
3. Remove ⊠R983 from CN4006.				
4. Fix a 47kΩ VR onto CN4006 with solder, and set the resistor value at maximum.				
5. Turn on the power of the projector. Connect a digital voltmeter to IC4001 ⑤ pin.	Digital voltmeter	IC4001 ⑤ pin		
6. Slowly turn the 47kΩ VR that is soldered to CN4006, and gradually lower the voltage of IC4001 ⑤ pin down to 1.49Vdc.				
7. Turn off the power of the projector.				
8. Remove the 47kΩ VR from CN4006, and measure the resistor value with the digital voltmeter. Put a resistor (metal oxide, 1/4W) that has same value as the measured resistor onto CN4006 and solder it.				
9. Turn on the power of the projector. Check if the voltage of IC4001 ⑤ pin is between 1.46 and 1.53Vdc.				
10. Receive FULL WHITE signal (PICTURE : 80%, BRIGHTNESS : 50%).	Full white pattern		PICTURE .....80% BRIGHTNESS .....center	
11. Turn off the power of the projector.				
[G BOARD]				G BOARD – COMPONENT SIDE – 
+B MAX VOLTAGE CONFIRMATION				
The following adjustments should always be performed when replacing IC6002 and R6054.				
1. Supply 230VAC to with variable autotransformer.				
2. Input monoscope signal.				
3. Set the PICTURE control and the BRIGHTNESS controls to reset.				
4. Confirm the voltage of G BOARD CN6014 ① pin connecter is less than 134.50 ± 1.00Vdc.		CN6014 ① pin		Voltage of CN6014 ① pin Less than 134.50 ±1.00Vdc
5. If step 4 is not satisfied, replace IC6002 and R6054 repeat above steps.				

SECTION 5
ELECTRICAL ADJUSTMENTS

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
B BOARD ADJUSTMENT **SUB COLOUR (SCOL) ADJUSTMENT** 1. Input the PAL Colour Bar signal and adjustment the picture control. 2. Set to service mode. 3. Connect an oscilloscope between ㉔ pin of IC409 and ground. 4. Adjust SCOL so that Vcy = VMg = VBi in the waveform levels. 5. Write the data to memory.	PAL Colour Bar pattern Oscilloscope	IC409 ㉔ pin (B(3/4) Board)	PICTURE .... 80% RGB SCOL : Vcy =VMg=VBi	<IC409 ㉔ pin> 
SUB HUE (MHUE,SHUE) ADJUSTMENT 1. Input the NTSC Colour Bar signal. 2. Set to service mode. 3. Connect an oscilloscope between ㉔ pin of IC409 and ground. 4. Adjust MHUE so that Vcy = VMg in the waveform levels. 5. Write the data to memory.	NTSC Colour Bar pattern Oscilloscope	IC409 ㉔ pin (B(3/4) Board)	MCD MHUE : Vcy =VMg	<IC409 ㉔ pin> 
(PIP MODE) 1. Input the NTSC Colour Bar signal. 2. Select PIP on screen mode and put the set into service mode. 3. Connect an oscilloscope between ㉔ pin of IC409 and ground. 4. Adjust SHUE so that Vcy = VMg in the waveform levels. 5. Write the data to memory.	NTSC Colour Bar pattern Oscilloscope	IC409 ㉔ pin (B(3/4) Board)	SCD SHUE : Vcy =VMg	(PIP MODE) < IC409 ㉔ pin > 
SUB CONTRAST (SCON) ADJUSTMENT (PIP MODE) 1. Input the PAL Colour Bar signal. 2. Select PIP on screen mode and put the set into service mode. 3. Connect an oscilloscope Q1 emitter on the B(1/4) board and ground. 4. Adjust SCON so that V MAIN-Y = V PIP-Y in the waveform levels. 5. Write the data to memory.	PAL Colour Bar pattern Oscilloscope	Q1 emitter (B(1/4) Board)	PIP SCON: V MAIN-Y =V PIP-Y	(PIP MODE) < B(1/4) board - Q1 emitter > 

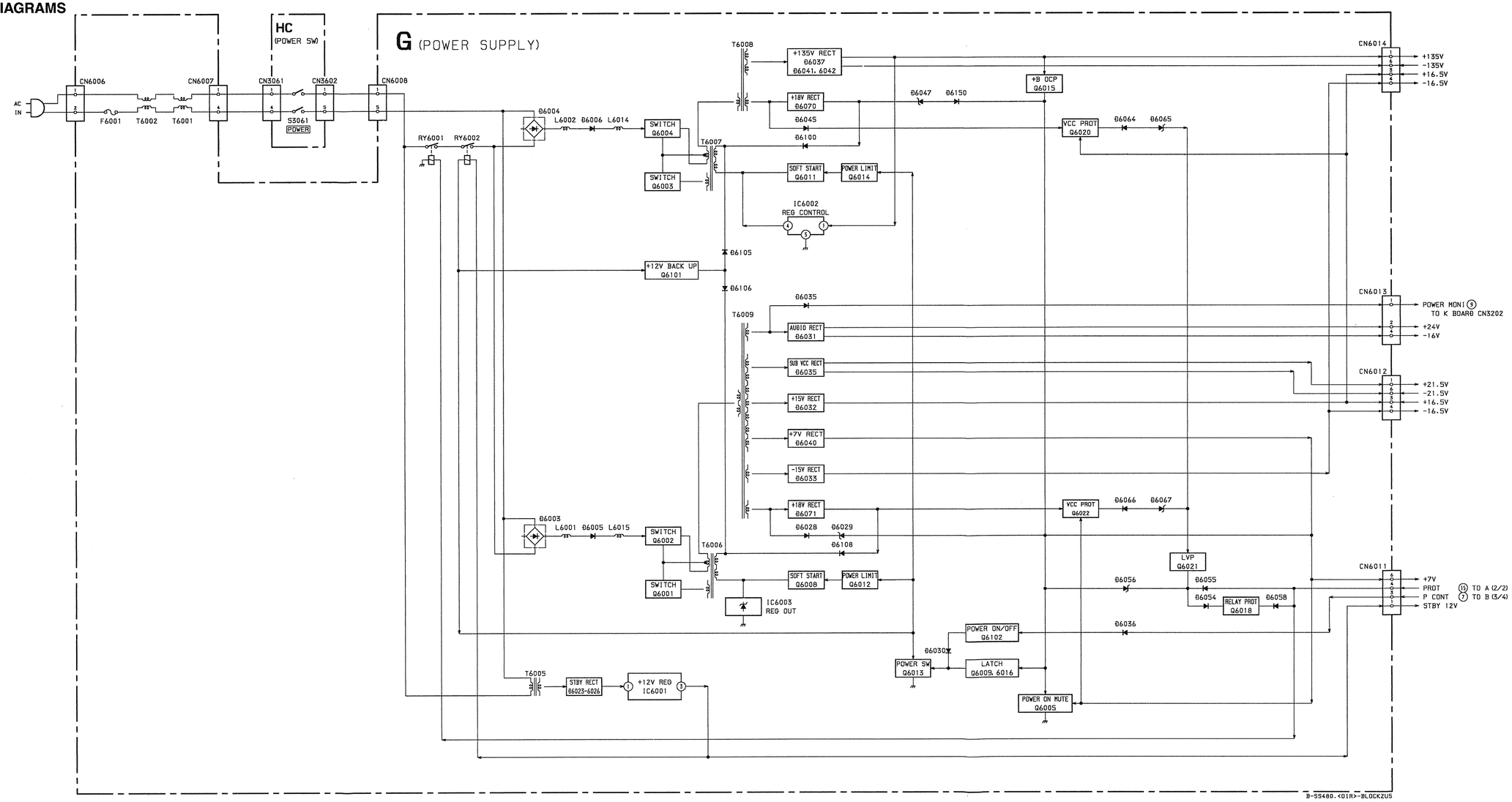
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
SUB WHITE BALANCE ADJUSTMENT (PIP MODE) 1. Input Gray Scale signal 20 IRE. 2. Select PIP in screen mode and put the set into service mode. 3. Connect an oscilloscope Q2 emitter on the B(1/4) board and ground. 4. Adjust RV1 so that V main = Vpip in the waveform levels. 5. Connect an oscilloscope Q7 emitter on the B(1/4) board and ground. 6. Adjust RV2 so that V main = Vpip in the waveform levels.	Oscilloscope	[B(1/4) Board] Q2 emitter (R-Y) Q7 emitter (B-Y)	[B(1/4) Board] RV1 (R-Y) RV2 (B-Y)	< Q2 emitter, Q7 emitter > 
P IN P POSITION ADJUSTMENT 1. Upon receiving the Monoscope signal. 2. Set service mode and then press the PIP command twice. The P in P positon will then move periodically to four points. Adjust " RDV " and " RDH " on the new screen so that the four points are distributed equally at ; up, down, left and right. 3. Write the data to memory.	Monoscope pattern		< PIP MENU > RDV RDH	
TEXT POSITION ADJUSTMENT 1. Receive the RF signal with TEXT. 2. Set to service mode. 3. Set the TEXT in MIX mode and adjust the screen positon with " TXH " and " TXV ". 4. Write the data to memory.			< TXT MENU > TXH (H position) TXV (V position)	
OSD POSITION ADJUSTMENT 1. Receive the PAL Colour Bar signal. 2. Set to service mode. 3. Adjust " OSH " so that the center line of the signal and the center of the crosshairs of the OSD display match are aligned with each other. 4. Write the data to memory.	PAL Colour Bar pattern		< CPU MENU > OSH	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
B2 BOARD ADJUSTMENT **SECAM FILTER ADJUSTMENT** 1. Receive the SECAM Colour Bar signal. 2. Adjust BELL filter by rotating L3503 so that ⑮ pin IC3502 should be flat/smooth chroma signal. 3. Adjust B-Y filter by rotating L3505 so that Q3508 emitter (R-Y out) should getsymmetrical transient between (R-Y)>(B-Y) and (B-Y)>(R-Y).	SECAM Colour Bar pattern	IC3502 ⑮ pin Q3508 emitter	L3503 L3505	< IC3502 ⑮ pin waveform > BAD GOOD BAD < Q3508 emitter waveform > BAD GOOD BAD
H. FREQUENCY ADJUSTMENT 1. Connect a frequency counter to ⑫ pin of IC3501. 2. Adjust RV3501 so that the frequency counter is 15.625KHz ± 50Hz. 3. Input a SECAM Colour Bar signal/p. 4. Confirm that ⑫ pin of IC3501 should be 15.625KHz ± 50Hz.	SECAM Colour Bar pattern	RV3501	IC3501 ⑫ pin	

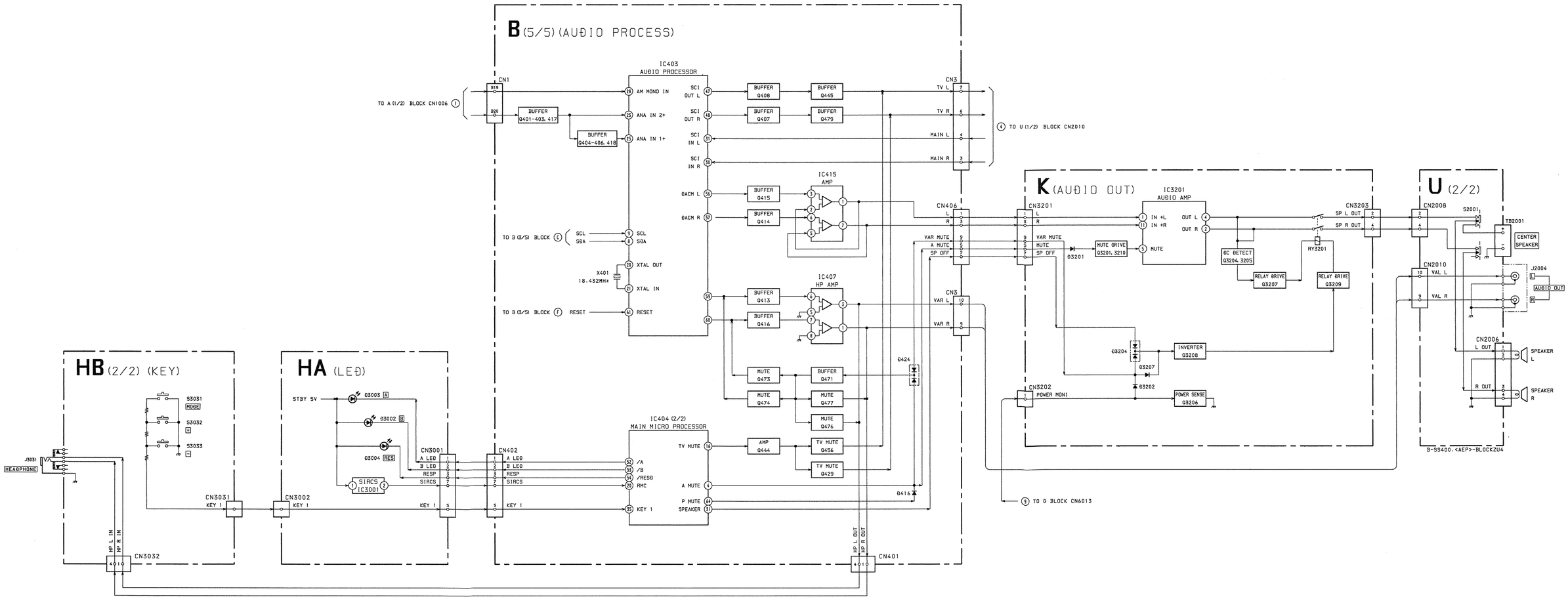
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
A BOARD ADJUSTMENT				
V BLANKING SIZE ADJUSTMENT 1. Receive PAL monoscope signal. 2. Select "BKU" in D/A menu. 3. Reduce the data value by pressing [3] and [6] on the commander to adjust blanking size and minimize the shear on the screen top. 4. Select "BKD" in D/A menu. 5. Increase the data value by pressing [3] and [6] on the commander to adjust blanking size and minimize the shear on the screen bottom.	PAL Monoscoope pattern			
H SIZE ADJUSTMENT 1. Receive a PAL monoscope signal. 2. Set to Service Mode. 3. Select H SIZE of VSP menu with the commander buttons [1] and [4]. 4. Adjust to 15.4 ± 0.2 square with [3] and [6].	PAL Monoscoope pattern			
S CORRECTION ADJUSTMENT 1. Receive a PAL monoscope signal. 2. Set to Service Mode. 3. Select VSCO of VSP menu with the commander buttons [1] and [4]. 4. Adjust to data "00" with [3] and [6].	PAL Monoscoope pattern			
V SIZE ADJUSTMENT 1. Receive a PAL monoscope signal. 2. Set to Service Mode. 3. Select V SIZE of VSP menu with the commander buttons [1] and [4]. 4. Adjust to 11.6 ± 0.2 square with [3] and [6].	PAL Monoscoope pattern			

SECTION 6
DIAGRAMS

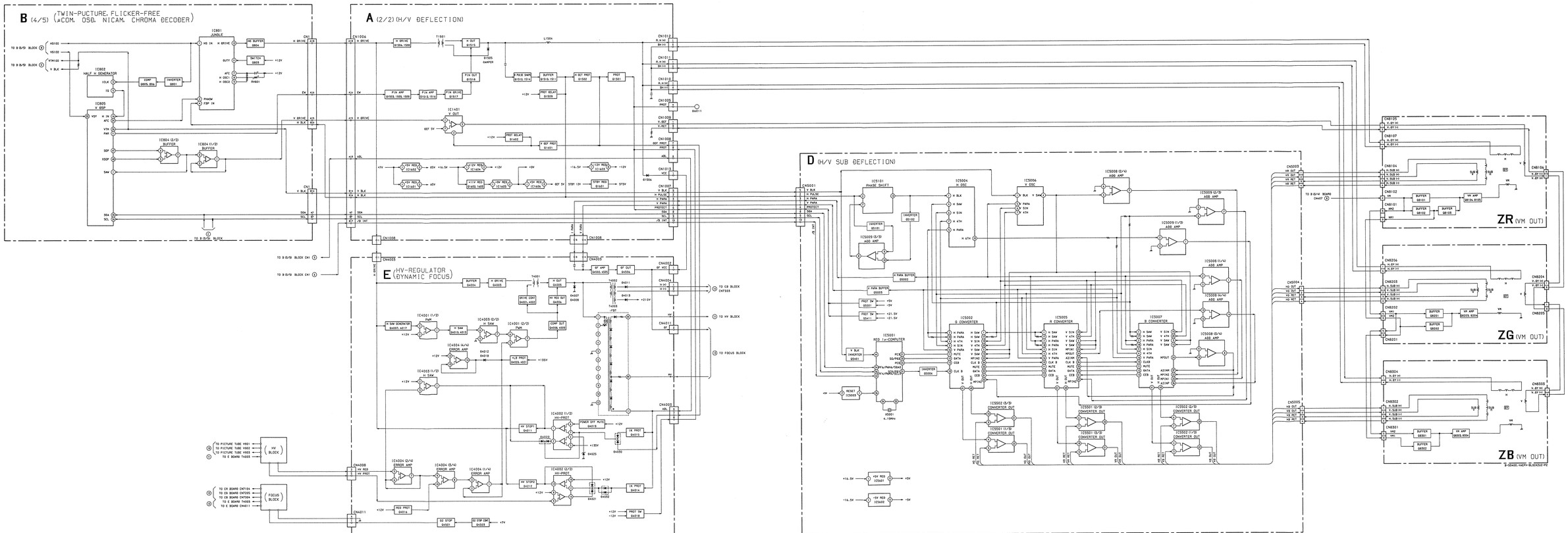
6-1. BLOCK DIAGRAM (1)



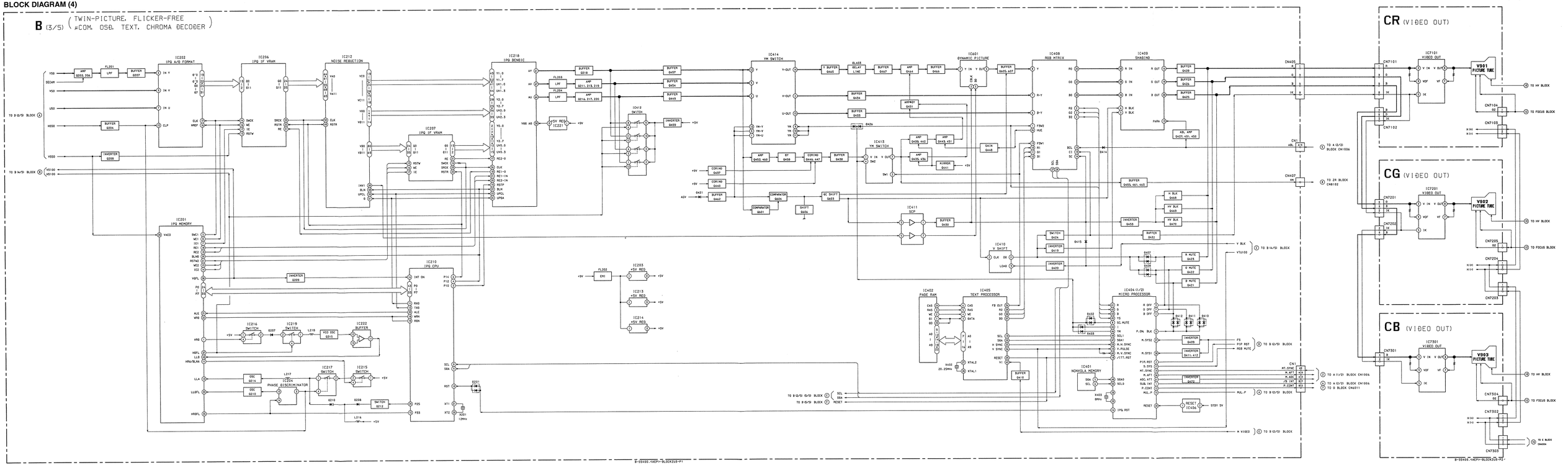
BLOCK DIAGRAM (2)



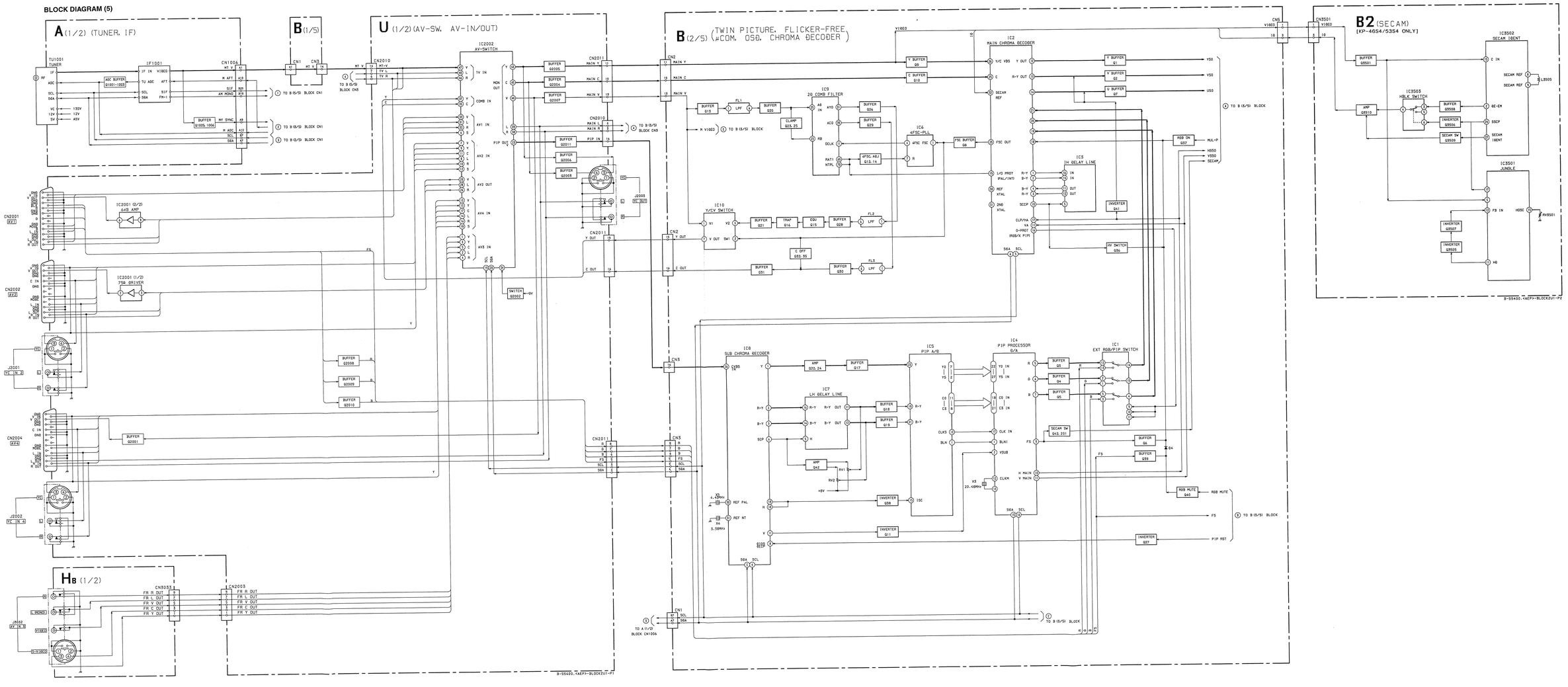
BLOCK DIAGRAM (3)

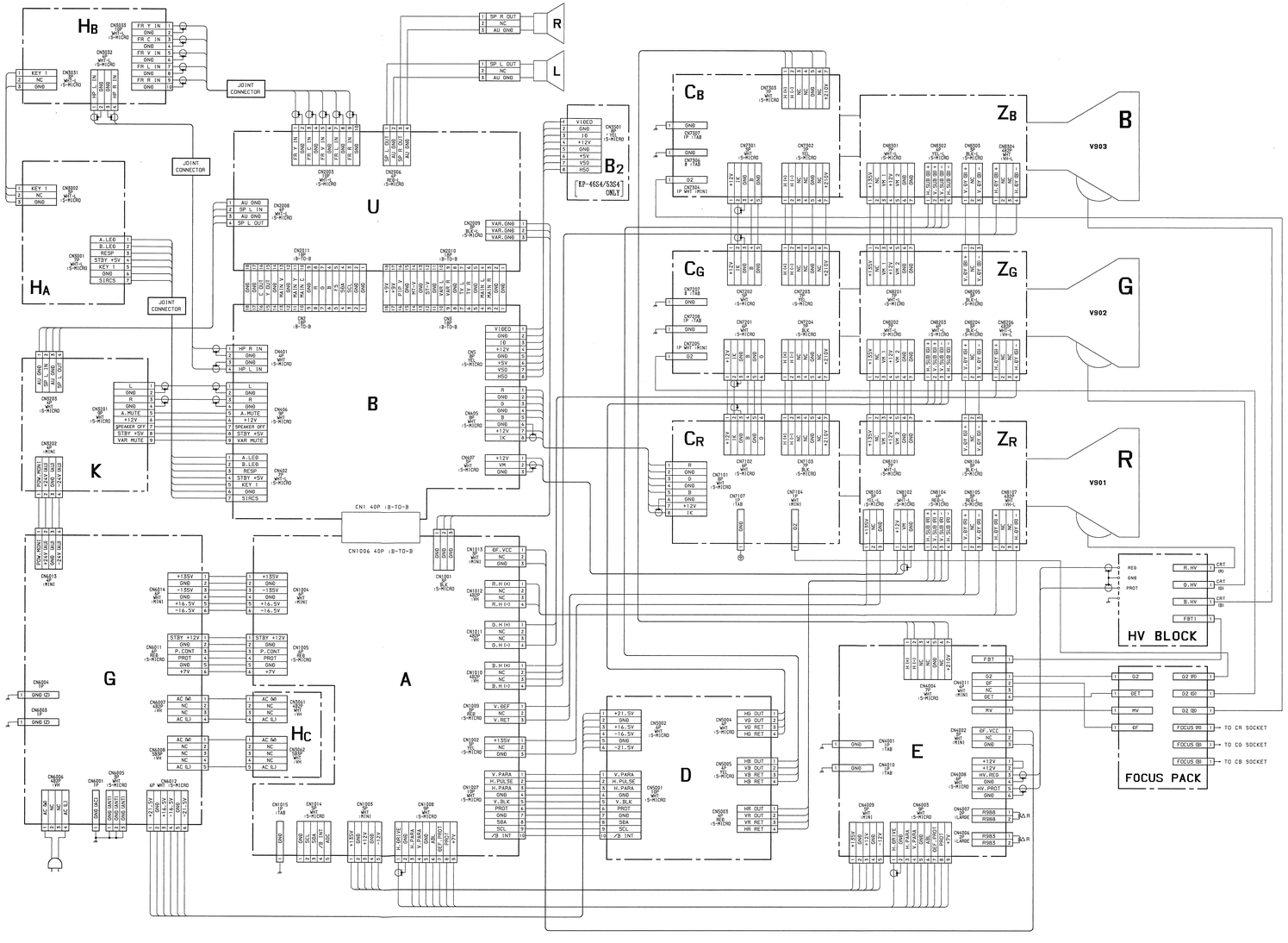

B (4/5) (TWIN-PUCTURE, FLICKER-FREE #COM, OSD, NICAM, CHROMA DECODER)
A (2/2) (H/V DEFLECTION)
D (H/V SUB DEFLECTION)
E (HV-REGULATOR /DYNAMIC FOCUS)
ZR (VM OUT)
ZG (VM OUT)
ZB (VM OUT)
IC801 JUNGLE
IC802 HALF H GENERATOR
IC805 V DSP
IC803 (1/2) BUFFER
IC804 (2/2) BUFFER
IC804 (1/2) BUFFER
IC401 V OUT
IC5101 PHASE SHIFT
IC5004 H OSC
IC5006 V OSC
IC5008 (2/4) ADD AMP
IC5009 (2/3) ADD AMP
IC5009 (1/3) ADD AMP
IC5008 (1/4) ADD AMP
IC5008 (4/4) ADD AMP
IC5008 (3/4) ADD AMP
IC5009 (3/3) ADD AMP
IC5002 G CONVERTER
IC5005 R CONVERTER
IC5007 B CONVERTER
IC5001 MCU (μ-COMPUTER)
IC5002 (3/3) CONVERTER OUT
IC5001 (2/3) CONVERTER OUT
IC5001 (3/3) CONVERTER OUT
IC5002 (2/3) CONVERTER OUT
IC5002 (1/3) CONVERTER OUT
IC4001 (2/3) PWR
IC4001 (1/2) PWR
IC4003 (2/3) H SAW
IC4003 (1/2) V SAW
IC4004 (4/4) ERROR AMP
IC4004 (3/4) ERROR AMP
IC4004 (2/4) ERROR AMP
IC4004 (1/4) ERROR AMP
IC4002 (1/2) HV-PROT
IC4002 (2/2) HV-PROT
CN1001 CRT
CN1002 CRT
CN1003 CRT
CN1004 CRT
CN1005 CRT
CN1006 CRT
CN1007 CRT
CN1008 CRT
CN1009 CRT
CN1010 CRT
CN1011 CRT
CN1012 CRT
CN5001 CRT
CN5003 CRT
CN5004 CRT
CN5005 CRT
CN8101 CRT
CN8102 CRT
CN8103 CRT
CN8104 CRT
CN8105 CRT
CN8106 CRT
CN8107 CRT
CN8109 CRT
CN8201 CRT
CN8202 CRT
CN8203 CRT
CN8204 CRT
CN8205 CRT
CN8206 CRT
CN8301 CRT
CN8302 CRT
CN8303 CRT
CN8304 CRT
CN8305 CRT
CN8306 CRT
CN4001 CRT
CN4002 CRT
CN4003 CRT
CN4004 CRT
CN4005 CRT
CN4006 CRT
CN4007 CRT
CN4008 CRT
CN4009 CRT
CN4010 CRT
CN4011 CRT
CN4012 CRT
CN4013 CRT
CN4014 CRT
CN4015 CRT
CN4016 CRT
CN4017 CRT
CN4018 CRT
CN4019 CRT
CN4020 CRT

BLOCK DIAGRAM (4)

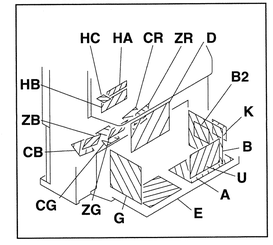


BLOCK DIAGRAM (5)





6-3. CIRCUIT BOARDS LOCATION



6-4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

Note:
- Capacitors without voltage indication are all 50V
  All capacitors are in μF unless otherwise noted.
- All resistors are in ohms.
  kΩ=1000Ω, MΩ=1000kΩ
- Indication of resistance, which dose not have one for rating electrical power, is as follows.
  Pitch : 5mm
  Rating electrical power : 1/4W
- 1/4W in resistance, 1/2W and 1/4W in chip resistance.
- : nonflammable resistor.
- : fusible resistor.
- : internal component.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : earth-chassis.
- The components identified by in this basic schematic diagram have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation.
  Should replacement be required, replace only with the value originally used.
- When replacing components identified by , make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by and repeat the adjustment until the specified value is achieved. (Refer to R988, R983 adjustment on Page 40-43.)

Part replaced ( )	Adjustment ( )
C4057, D4026, R988, R4019, T4002, T4003 (FBT), E BOARD, HV BLOCK	HOLD-DOWN (R988)
C4033, C4034, C4046, C4047,C4049, D4012, D4018, D4023, D4028, D4035,R983, R4022, R4046, R4047, R4048, R4053, R4054, R4057, R4059, R4060, R4061, R4077, R4079, R4086, R4087, R4088, R4091, R4092, R4097, R4098, R4100, Q4013, T4002, T4003 (FBT), E Board , HV Block	HOLD-DOWN (R983)

- When replacing the part in below table, be sure to perform the related adjustment.
- Readings are taken with a color-bar signal input.
  no mark : PAL
  ( ) : SECAM
  { } : NTSC 3.58
- Readings are taken with a 10MΩ digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
  * : Measurement impossibility.
- : B+line.
- : B-line.
  (Actual measured value may be different).
- : signal path.
- Circled numbers are waveform references.

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RW	NONFLAMMABLE WIREWOUND
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: ※	ADJUSTMENT RESISTOR
COIL	: LF-BL	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: The symbol display is on the component side.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

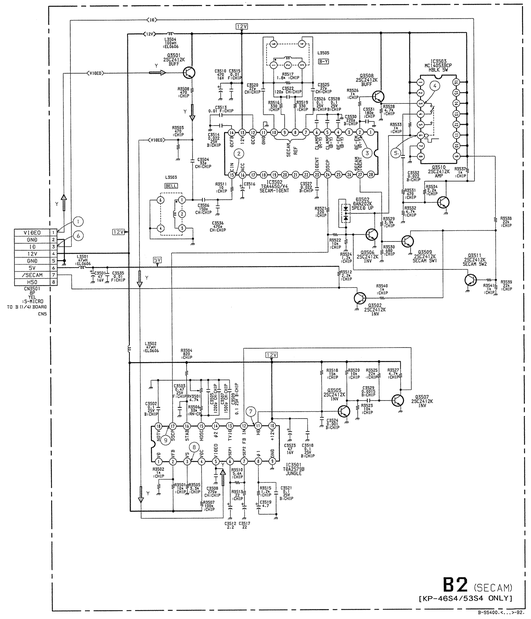
The symbol indicate fast operating fuse. Replace only with fuse of same rating as maked.

Terminal name of semiconductors in silk screen printed circuit (*)

	Device	Printed symbol	Terminal name	Circuit
①	Transistor	T	Collector / Base / Emitter	
②	Transistor	—	Collector / Base / Emitter	
③	Diode		Cathode / Anode	
④	Diode	T	Cathode / Anode (NC)	
⑤	Diode	—	Cathode / Anode (NC)	
⑥	Diode	T	Common Anode / Cathode	
⑦	Diode	—	Common Anode / Cathode	
⑧	Diode	T	Common Anode / Anode	
⑨	Diode	—	Common Anode / Anode	
⑩	Diode	T	Common Cathode / Cathode	
⑪	Diode	—	Common Cathode / Cathode	
⑫	Transistor (FET)		Drain / Source / Gate	
⑬	Transistor (FET)		Drain / Source / Gate	
⑭	Transistor (FET)		D Source / Drain / G Gate	
–	Discrete semiconductot			

Ver.1.1

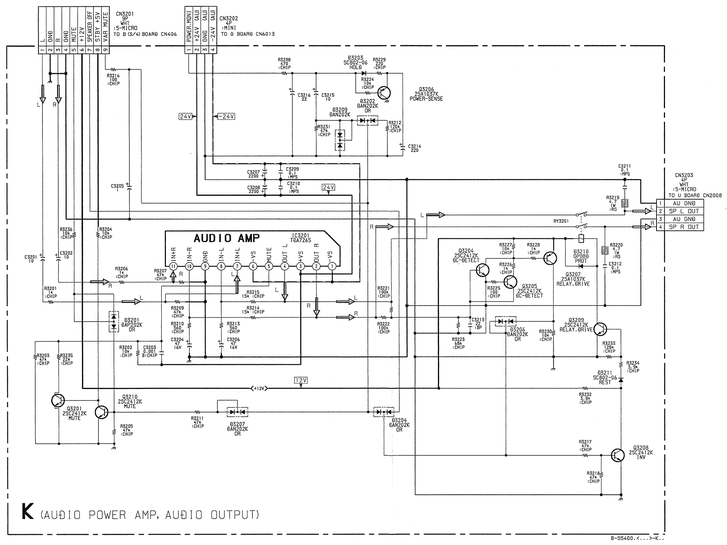
(Chip semiconductors that are not actually used are included.)



B2 BOARD IC VOLTAGE LIST

	Pin	Voltages
IC3501	1	–
	2	<1.1>
	3	<0.3>
	4	<11.1>
	5	<2.2>
	6	<7.6>
	7	<8.6>
	8	<2.8>
	9	GND
	10	<11.6>
	11	<0.3>
	12	<1.2>
	13	–
	14	<2.5>
	15	<4.4>
	16	<9.1>
	17	<1.6>
	18	<6.2>
IC3502	1	–
	2	<7.0>
	3	–
	4	<7.0>
	5	<9.7>
	6	<9.9>
	7	<3.4>
	8	<2.9>
	9	<2.9>
	10	<2.9>
	11	GND
	12	<2.4>
	13	<11.6>
	14	<5.8>
	15	<3.4>
	16	<7.9>
	17	–
	18	–
	19	–
	20	–
	21	–
	22	–
	23	<7.5>
	24	<1.5>
	25	–
	26	–
	27	<5.7>
	28	–
IC3503	1	<11.6>
	2	<11.6>
	3	<5.4>
	4	<6.4>
	5	<10.8>
	6	GND
	7	GND
	8	<11.6>
	9	<11.6>
	10	<11.6>
	11	<11.6>
	12	<11.6>
	13	<11.6>
	14	<11.6>
	15	<11.6>
	16	<11.6>

All voltages are in V.
– : Blank Pin



K BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q3201	0.8	0.1	GND
Q3204	0	12.4	GND
Q3205	GND	12.3	0
Q3206	12.3	0	12.3
Q3207	12.3	0	12.8
Q3208	0.2	6.6	GND
Q3209	0.7	0.1	GND
Q3210	0	0.8	GND

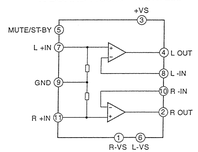
All voltages are in V.

K BOARD IC VOLTAGE LIST

	Pin	Voltages
IC3201	1	-24.0
	2	0
	3	24.0
	4	0
	5	13.8
	6	-24.0
	7	0
	8	0
	9	GND
	10	0
	11	0

All voltages are in V.

K BOARD : IC3201 TDA7265

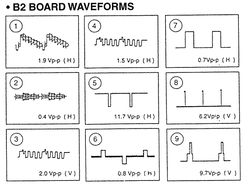


B2 BOARD TRANSISTOR VOLTAGE LIST

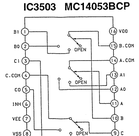
	B	C	E
Q3501	<5.1>	<11.6>	<4.4>
Q3502	<2.3>	<4.7>	GND
Q3505	<0.3>	<2.8>	GND
Q3506	<0.2>	<10.8>	GND
Q3507	<0.2>	<1.1>	GND
Q3508	<7.1>	<11.6>	<6.4>
Q3509	<0.7>	<0.1>	GND
Q3510	<6.8>	<1.2>	<0.1>
Q3511	<0.1>	<0.2>	GND

All voltages are in V.

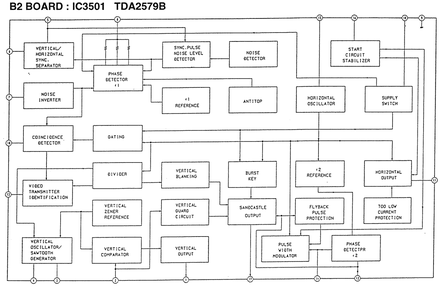
• B2 BOARD WAVEFORMS



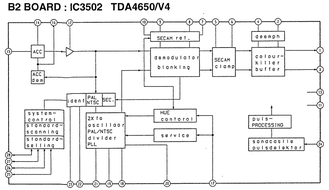
B2 BOARD : IC3503 MC14053BCP



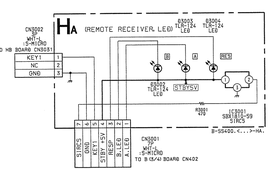
B2 BOARD : IC3501 TDA2579B



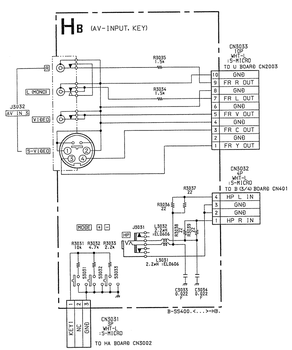
B2 BOARD : IC3502 TDA4650/V4



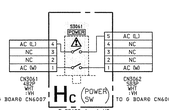
HA (REMOTE RECEIVER, LED)



HB (AV-INPUT, KEY)

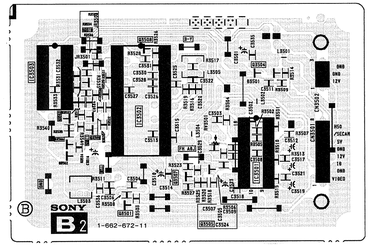


HC (POWER SW)



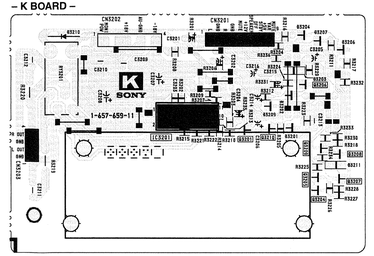
B2 [SECAM] (KP-46S4/53S4 ONLY)

– B2 BOARD –



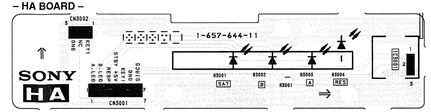
K [AUDIO POWER AMP, AUDIO AMP]

– K BOARD –



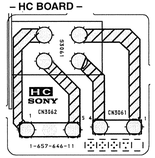
HA [REMOTE RECEIVER, LED]

– HA BOARD –



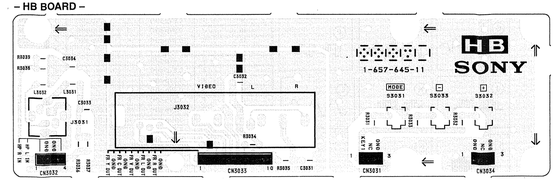
HC [POWER SWITCH]

– HC BOARD –

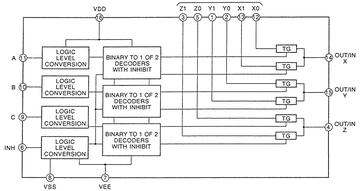


HB [AV INPUT 3, FUNCTION KEY]

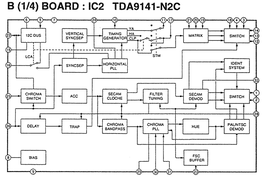
– HB BOARD –



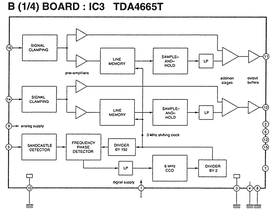
B (1/4) BOARD : IC1 MC14053BF



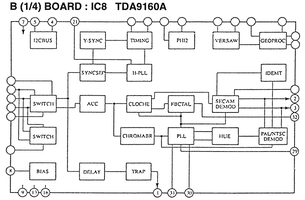
B (1/4) BOARD : IC2 TDA9141-N2C



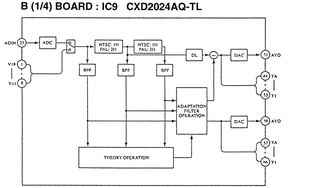
B (1/4) BOARD : IC3 TDA4665T



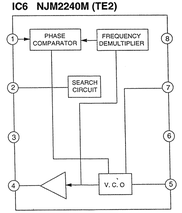
B (1/4) BOARD : IC8 TDA9160A



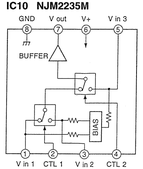
B (1/4) BOARD : IC9 CXD2024AQ-TL



B (1/4) BOARD : IC6 NJM2240M (TE2)



B (1/4) BOARD : IC10 NJM2235M



B(1/4) BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q1	3.2	7.6	2.6
Q2	2.6	7.6	2.0
Q3	0	GND	0.7
Q4	0	GND	0.7
Q5	0	GND	0.7
Q6	0	4.8	0.7
Q7	2.6	7.6	2.0
Q8	0.1	8.8	0
Q9	5.1	GND	5.7
Q10	0	8.8	4.4
Q11	3.8	0.3	GND
Q12	0.4	4.6	GND
Q13	3.3	4.8	2.9
Q14	4.6	4.4	4.8
Q17	2.7	8.0	2.0
Q18	3.0	8.0	2.4
Q19	3.0	8.0	2.4
Q20	3.1	4.8	2.5
Q22	7.0	2.7	8.0
Q23	1.1	4.8	1.5
Q24	2.3	7.0	1.7
Q25	0.5	GND	1.1
Q26	1.4	GND	2.0
Q27	0	5.0	GND
Q28	2.3	GND	3.0
Q29	1.5	GND	2.1
Q30	2.4	GND	3.0
Q31	0	4.7	0
Q32	2.4	0	GND
Q35	0	2.4	GND
Q36	0.7	7.6	0.7
Q37	0	7.6	0
Q38	0.1	4.4	GND
Q39	0	GND	0.7
Q40	0	0.7	GND
Q41	0	6.9	GND
Q42	1.6	8.5	1.0
Q43	0	0.6	GND

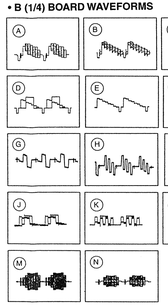
All voltages are in V.

B(1/4) BOARD IC VOLTAGE LIST

	Pin	Voltages		Pin	Voltages		Pin	Voltages
IC1	1	0		25	1.3 <1.7>	IC9	1	GND
	2	0.8		26	0.8		2	GND
	3	0		27	1.0		3	GND
	4	0.8		28	4.8		4	GND
	5	0.8	IC5	1	4.1		5	GND
	6	GND		2	1.0		6	GND
	7	GND		3	0.8		7	GND
	8	GND		4	1.3 <1.7>		8	GND
	9	1.9		5	1.9		9	GND
	10	1.9		6	2.0 (2.5) <1.1>		10	GND
	11	1.9		7	1.8 (1.5) <1.3>		11	2.3
	12	0.8		8	0.6 <1.3>		12	GND
	13	0		9	1.0 <1.6>		13	4.8
	14	1.0		10	0.6 <1.6>		14	0
	15	1.0		11	1.0 <1.8>		15	0
	16	8.8		12	2.5		16	0
IC2	1	2.5		13	GND		17	4.8
	2	2.5		14	–		18	4.8
	3	2.5		15	4.4		19	GND
	4	2.5		16	GND		20	4.6
	5	4.6		17	2.0 (2.5) <1.8>		21	1
	6	4.7		18	GND		22	0.5
	7	7.6		19	2.6		23	GND
	8	5.0		20	1.0		24	GND
	9	GND		21	2.5		25	1.5
	10	0.7		22	1.9		26	4.8
	11	0.1		23	2.3		27	2.4
	12	3.2		24	4.8		28	4.8
	13	2.6		25	GND		29	4.8
	14	2.6		26	GND		30	GND
	15	0.3		27	GND		31	1.4
	16	0.3		28	4.8		32	3.0
	17	0.3	IC6	1	2.4		33	3.0
	18	0.8		2	1.8		34	3.0
	19	4.8		3	GND		35	GND
	20	4.8		4	2.9		36	1.1
	21	4.8		5	3.0		37	4.7
	22	3.2		6	4.8		38	GND
	23	0.1		7	2.4		39	1.5
	24	3.9	IC7	1	4.8		40	3.9
	25	0		2	–		41	3.0
	26	3.8		3	GND		42	3.0
	27	0		4	GND		43	GND
	28	3.4		5	0.6		44	–
	29	4.7		6	–		45	–
	30	2.3		7	–		46	–
	31	1.5		8	GND		47	–
	32	0.4		9	4.8		48	–
IC3	1	4.8		10	GND		49	–
	2	–		11	3.1		50	–
	3	GND		12	3.1		51	–
	4	GND		13	–		52	GND
	5	0.7		14	1.4		53	4.8
	6	–		15	–		54	–
	7	–		16	1.4		55	–
	8	GND	IC8	1	2.3		56	4.8
	9	4.8		2	2.2		57	–
	10	GND		3	2.1		58	–
	11	3.0		4	4.4 (4.6) <4.6>		59	–
	12	3.0		5	4.5 (4.6) <4.3>		60	–
	13	–		6	0.7		61	–
	14	1.4		7	8.0		62	–
	15	–		8	5.0		63	–
	16	1.4		9	GND		64	–
IC4	1	4.1		10	0.3		65	–
	2	0.3		11	7.2		66	–
	3	4.8		12	3.8		67	4.8
	4	1.6		13	0		68	4.8
	5	0		14	2.1		69	0.5
	6	0.5		15	GND		70	0.5
	7	0		16	GND		71	GND
	8	GND		17	–		72	GND
	9	0		18	3.6		73	4.8
	10	0.3		19	0.3		74	4.8
	11	0.1		20	3.8 (4.0)		75	GND
	12	2.0		21	–		76	GND
	13	2.4		22	–		77	GND
	14	GND		23	–		78	GND
	15	4.7		24	–		79	GND
	16	4.7		25	8.0		80	GND
	17	2.5		26	3.3 (3.8)	IC10	1	4.4
	18	1.0 <1.8>		27	GND		2	0
	19	0.8 <1.6>		28	3.4		3	4.4
	20	1.0 <1.6>		29	4.3 (4.7) <4.3>		4	GND
	21	0.8 <1.3>		30	2.1 (2.3) <2.1>		5	3.6
	22	1.8 (1.5) <1.3>		31	1.7 (1.5) <1.3>		6	8.8
	23	2.0 (2.5) <1.1>		32	3.8 (0.8) <3.8>		7	3.7
	24	1.9					8	GND

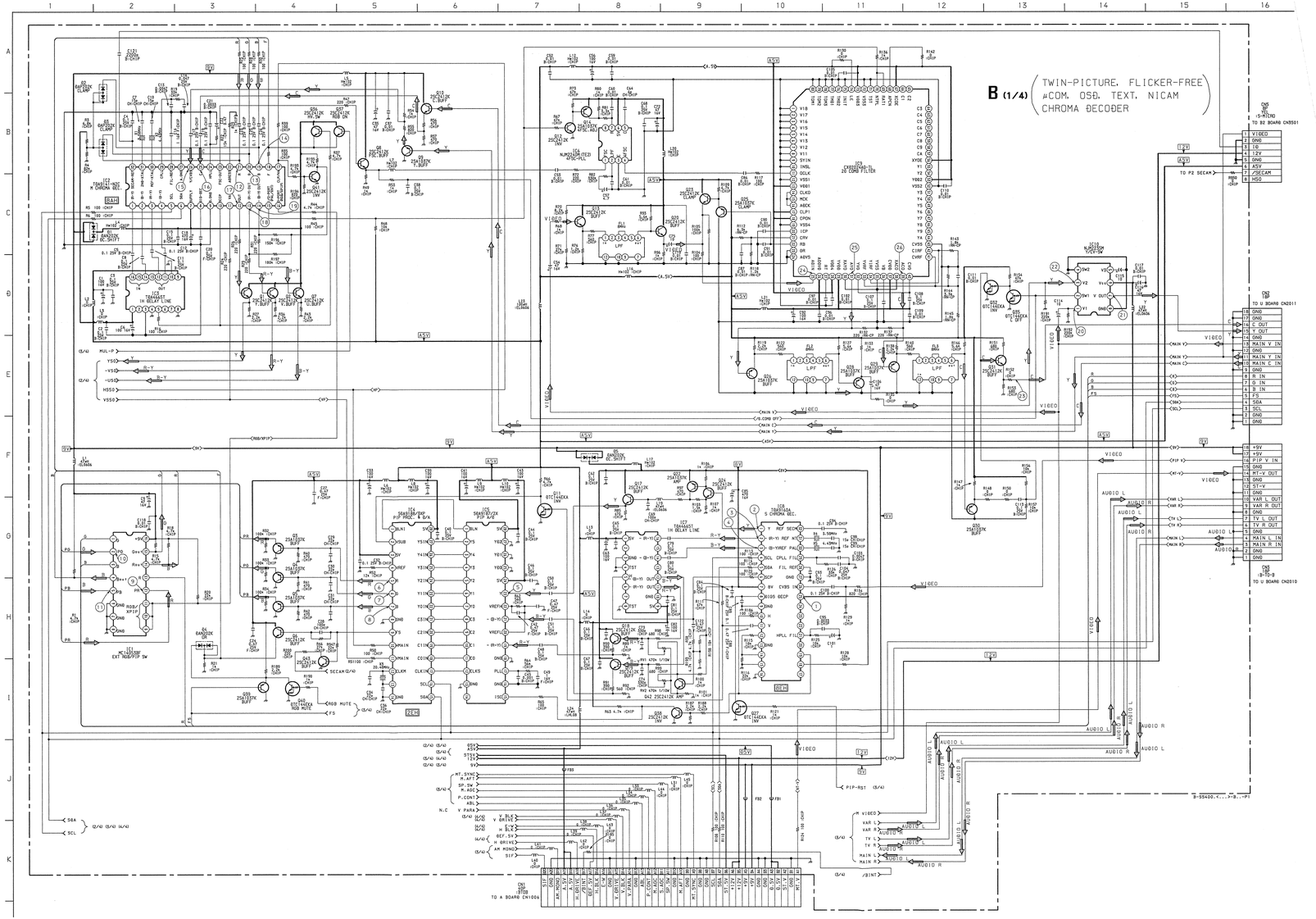
All voltages are in V.
– : Blank Pin

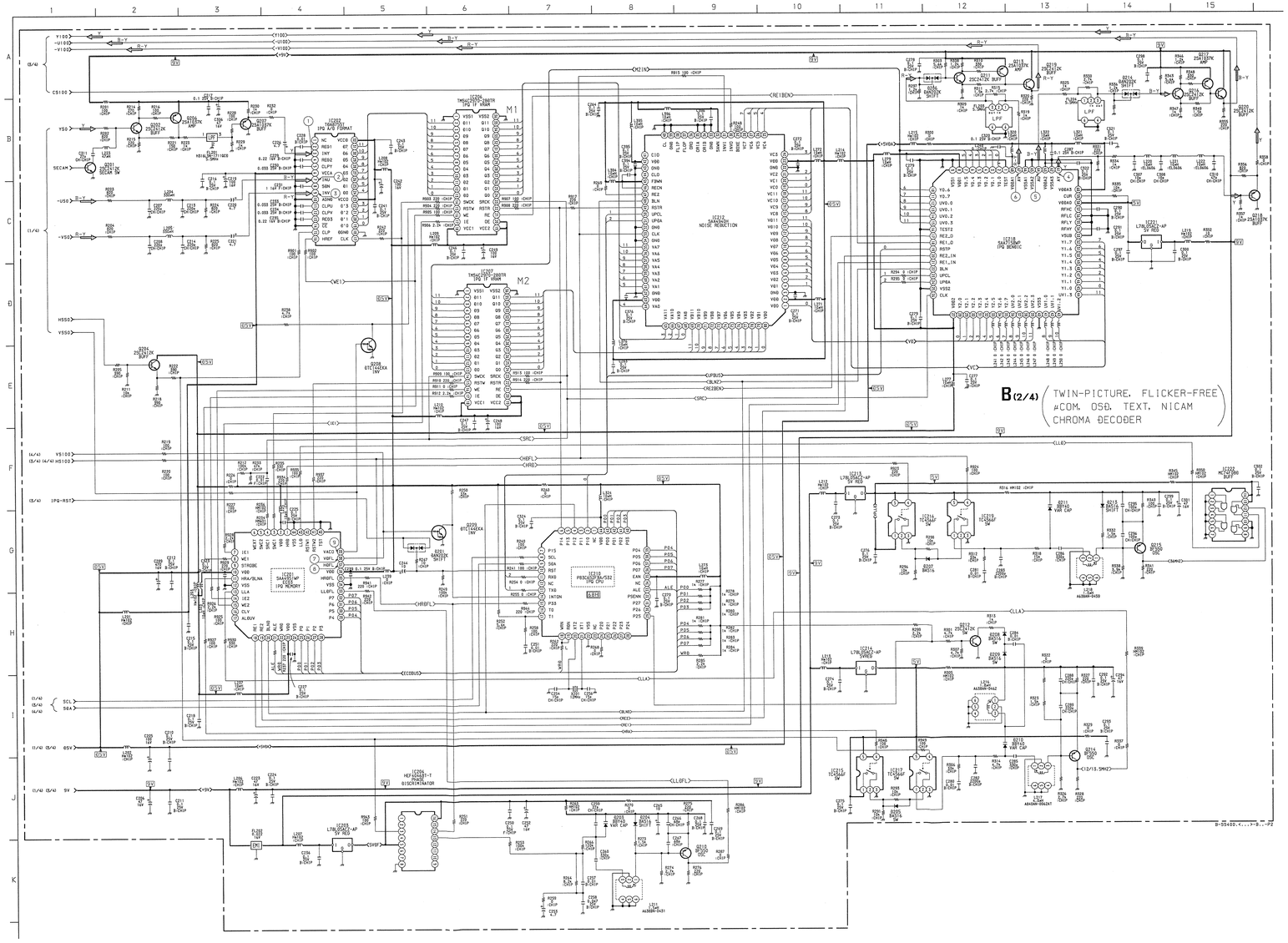
• B (1/4) BOARD WAVEFORMS



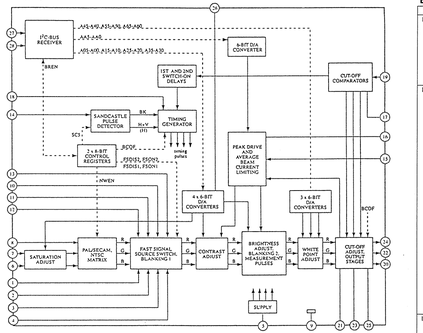
WAVEFORMS B (1/4) BOARD

CIRCUIT WAVEFORM REFERENCE		PAL		SECAM		NTSC 3.58 4.43
1	A	1.2Vp-p(H)	B	1.0Vp-p(H)	C	1.1Vp-p(H)
2	D	0.6Vp-p(H)	E	0.4Vp-p(H)	D	0.6Vp-p(H)
3	G	0.7Vp-p(H)	G	1.2Vp-p(H)	G	0.6Vp-p(H)
4	H	0.8Vp-p(H)	H	1.5Vp-p(H)	H	0.7Vp-p(H)
5	D	1.2Vp-p(H)	E	0.8Vp-p(H)	D	0.9Vp-p(H)
6	I	0.8Vp-p(H)	I	1.0Vp-p(H)	I	0.8Vp-p(H)
7	J	0.9Vp-p(H)	J	1.0Vp-p(H)	J	0.7Vp-p(H)
8	K	0.9Vp-p(H)	K	0.9Vp-p(H)	K	0.7Vp-p(H)
9	I	0.9Vp-p(H)	I	0.9Vp-p(H)	I	0.7Vp-p(H)
10	J	0.9Vp-p(H)	J	0.9Vp-p(H)	J	0.7Vp-p(H)
11	K	0.8Vp-p(H)	K	0.8Vp-p(H)	K	0.8Vp-p(H)
12	I	0.8Vp-p(H)		–	I	0.8Vp-p(H)
13	J	0.8Vp-p(H)		–	J	0.8Vp-p(H)
14	K	0.8Vp-p(H)		–	K	0.8Vp-p(H)
15	A	1.2Vp-p(H)		–		–
16	N	0.9Vp-p(H)		–		–
17	F	1.3Vp-p(H)	F	1.1Vp-p(H)	F	1.1Vp-p(H)
18	G	1.2Vp-p(H)	G	1.0Vp-p(H)	G	1.0Vp-p(H)
19	H	1.7Vp-p(H)	H	1.5Vp-p(H)	H	1.3Vp-p(H)
20	C	2.5Vp-p(H)		–		–
21	D	2.3Vp-p(H)		–		–
22	C	2.3Vp-p(H)		–		–
23	M	1.8Vp-p(H)		–		–
24	C	1.9Vp-p(H)		–		–
25	D	2.7Vp-p(H)		–		–
26	N	2.5Vp-p(H)		–		–

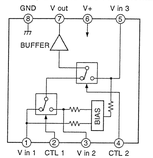



B(2/4)
TWIN-PICTURE, FLICKER-FREE
μCOM, OSD, TEXT, NICAM
CHROMA DECODER
IC212
SAA4960H/V2
NOISE REDUCTION
IC218
SAA4970H/V1
TPQ GENETIC
IC2202
TMP47C1637N
TPQ I/F VRAM
IC2203
TMP47C1637N
TPQ I/F VRAM
IC2302
TMP47C1637N
TPQ A/D FORMAT
IC2301
SAA4961WP
TPQ MEMORY
IC2303
TPQ CPU
IC2204
HCF4046B
PHASE LOCKED LOOP
IC2205
HCF4094BC1
SHIFT REGISTER
IC2206
M51132FP
OSD SCREEN GENERATOR
IC2207
BU4066BCF
CMOS SW
IC2208
M51132FP
OSD SCREEN GENERATOR
IC2209
BU4066BCF
CMOS SW
IC2210
BU4066BCF
CMOS SW
IC2211
BU4066BCF
CMOS SW
IC2212
BU4066BCF
CMOS SW
IC2213
BU4066BCF
CMOS SW
IC2214
BU4066BCF
CMOS SW
IC2215
BU4066BCF
CMOS SW
IC2216
BU4066BCF
CMOS SW
IC2217
BU4066BCF
CMOS SW
IC2218
BU4066BCF
CMOS SW
IC2219
BU4066BCF
CMOS SW
IC2220
M51132FP
OSD SCREEN GENERATOR
IC2221
BU4066BCF
CMOS SW
IC2222
BU4066BCF
CMOS SW
M1
M2
Y1OO
U1OO
V1OO
Y1OI
U1OI
V1OI
R-Y
B-Y
5V
9V
12V
15V
65V
SECAM
VSS
HSS
SCL
SDA
IIC
IPQ-RST
CLL0
CLLA
CLLOFL
CSYNO
CVBSO
CVBS1
CVBS2
CVBS3
CVBS4
CVBS5
CVBS6
CVBS7
CVBS8
CVBS9
CVBS10
CVBS11
CVBS12
CVBS13
CVBS14
CVBS15
CVBS16
CVBS17
CVBS18
CVBS19
CVBS20
CVBS21
CVBS22
CVBS23
CVBS24
CVBS25
CVBS26
CVBS27
CVBS28
CVBS29
CVBS30
CVBS31
CVBS32
CVBS33
CVBS34
CVBS35
CVBS36
CVBS37
CVBS38
CVBS39
CVBS40

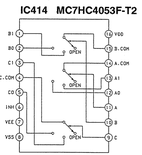
B (3/4) BOARD : IC408 TDA4780



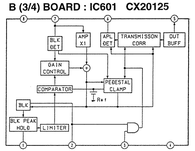
B (3/4) BOARD : IC413 NJM2234M



B (3/4) BOARD : IC414 MC74HC4053F-T2



B (3/4) BOARD : IC601 CX20125



B(3/4) BOARD ※MARK LIST

	KP-46S4/46S4V/53S4/53S4U	KP-46S4K/53S4K
IC404	CXP85460-037Q	CXP85460-047Q
IC405	TPU3040-TC20	TPU3041TC-22-TP
IC411	BA10393F-E2	LM393FS-E2D
IC415	BA10358F-E2	LM358DR-EZ

B(3/4) BOARD IC VOLTAGE LIST

	Pin	Voltages		Pin	Voltages		Pin	Voltages		Pin	Voltages
IC401	1	GND		57	0.2		15	2.5		22	1.8
	2	GND		58	0		16	2.5		23	4.5
	3	GND		59	0.2		17	–		24	1.2
	4	GND		60	0.2		18	–		25	4.3
	5	5.0		61	4.7		19	4.7		26	4.3
	6	5.0		62	–		20	4.4		27	11.8
	7	GND		63	–		21	–		28	2.1
	8	5.0		64	–		22	–		29	9.7
IC402	1	1.8		65			23	–		30	2.3
	2	4.9		66	GND		24	–	IC410	1	4.8
	3	4.7		67	4.8		25	0		2	0.7
	4			68			26	0		3	4.8
	5	–	IC404	1	5.0		27	2.5		4	4.8
	6	–		2	0		28	0		5	GND
	7	–		3	0		29	5.1		6	GND
	8	–		4	0		30	–		7	4.8
	9	2.5		5	–		31	–		8	GND
	10	2.5		6	–		32	–		9	4.5
	11	2.5		7	0		33	–		10	0.7
	12	2.5		8	0		34	4.9		11	4.4
	13	4.9		9	0		35	GND		12	–
	14	2.5		10	0		36	0		13	–
	15	2.5		11	0		37	0		14	–
	16	2.5		12	5.0		38	0		15	–
	17	2.5		13	5.0		39	0		16	4.8
	18	2.5		14	5.0		40	GND	IC411	1	1.6
	19	–		15	5.0		41	4.9		2	5.0
	20	–		16	5.0		42	0.4		3	5.0
	21	–		17	5.0		43	GND		4	GND
	22	2.5		18	5.0		44	–		5	4.3
	23	–	IC406	1	5.0		5	4.3		6	5.0
	24	4.8		20	5.0		2	5.0		7	0.8
	25	1.8		21	0.4		3	GND		8	8.8
	26	GND		22	0	IC407	1	6.0	IC412	2	5.0
IC403	1	–		23	0		2	11.4		2	3.0
	2	–		24	5.0		3	6.0		3	3.0
	3	–		25	5.0		4	GND		4	3.0
	4	–		26	GND		5	1.3		5	0.5
	5	–		27	0		6	0.8		6	0.5
	6	–		28	2.5		7	0.8		7	GND
	7	–		29	2.5		8	1.3		8	3.0
	8	4.4	IC408	30	5.0	1	1	5.2		9	3.0
	9	4.4		31	0		2	5.2		10	3.0
	10	GND		32			3	5.2		11	3.0
	11	4.4		33	GND		4	5.2		12	0.4
	12	GND		34	5.0		5	8.2		13	0.4
	13	–		35	5.0		6	4.1		14	4.8
	14	–		36	5.0		7	4.1	IC413	1	0
	15	GND		37	5.0		8	3.9		2	0
	16	GND		38	0		9	GND		3	5.4
	17	–		39	2.7		10	5.2		4	0
	18	–		40	2.7		11	5.2		5	5.4
	19	GND		41	0		12	5.2		6	5.4
	20	2.5		42	0		13	0		7	4.7
	21	2.1		43	0		14	1.3		8	GND
	22	GND		44	0		15	4.1	IC414	1	2.5
	23	0		45	0		16	3.3		2	2.5
	24	1.6		46	0		17	5.2		3	2.5
	25	1.6		47	4.8		18	2.3		4	2.5
	26	4.8		48	5.0		19	1.6		5	2.5
	27	4.9		49	4.7		20	2.0		6	GND
	28	3.9		50	5.0		21	2.9		7	GND
	29	2.7		51	–		22	2.0		8	GND
	30	3.9		52	3.6		23	2.9		9	0
	31	3.9		53	3.6		24	2.3		10	0
	32	GND		54	3.6		25	3.1		11	0
	33	3.9		55	GND		26	4.5		12	2.6
	34	3.9		56	5.0		27	4.5		13	2.6
	35	GND		57	5.0		28	4.5		14	2.6
	36	3.9		58	5.0	IC409	1	GND		15	2.6
	37	3.9		59	0.5		2	4.4		16	4.8
	38	GND		60	0.5		3	4.1	IC415	1	0.8
	39	3.9		61	0		4	1.4		2	4.8
	40	3.9		62	–		5	0.7		3	4.8
	41	3.9		63	–		6	0.7		4	GND
	42	3.9		64	0		7	7.0		5	4.8
	43	GND	IC405	1	2.5		8	7.0		6	4.8
	44	7.3		2	0		9	6.1		7	0.8
	45	8.4		3	1.8		10	5.7		8	8.1
	46	7.3		4	4.9		11	5.7	IC601	1	8.4
	47	3.9		5	4.7		12	11.8		2	0.8
	48	3.9		6	4.8		13	2.5		3	0.6
	49	GND		7	2.5		14	6.2		4	GND
	50	–		8	2.5		15	4.1		5	7.6
	51	–		9	2.5		16	2.5		6	0.1
	52	GND		10	2.5		17	GND		7	5.8
	53	3.9		11	2.5		18	2.0		8	11.8
	54	3.9		12	2.5		19	11.8			
	55	GND		13	2.5		20	2.0			
	56	0.2		14	2.5		21	1.8			

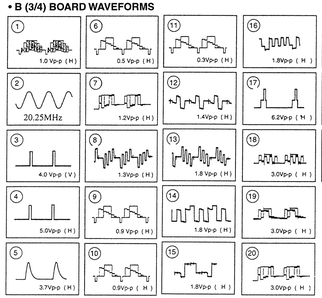
All voltages are in 'V,
–: Blank Pin

B(3/4) BOARD TRANSISTOR VOLTAGE LIST

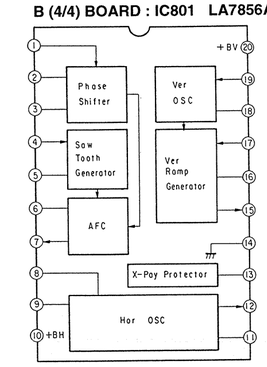
	B	C	E
Q401	6.3	11.8	5.7
Q402	11.3	6.3	11.8
Q403	6.4	11.6	5.8
Q404	6.2	11.8	5.5
Q405	3.0	11.3	2.4
Q406	5.7	11.8	5.0
Q407	3.9	GND	4.5
Q408	4.0	GND	4.5
Q409	0	5.0	GND
Q410	0.7	GND	3.2
Q411	3.1	0	GND
Q412	0	3.1	GND
Q413	0	GND	0.8
Q414	0.2	GND	0.8
Q415	0.2	GND	0.8
Q416	0.2	GND	0.8
Q417	5.5	GND	6.3
Q418	11.3	6.2	11.8
Q419	4.4	0.7	GND
Q420	0.6	4.5	GND
Q421	0	2.6	GND
Q422	0	2.6	GND
Q423	0	2.6	GND
Q424	0.7	0	GND
Q425	2.1	GND	2.4
Q426	2.0	GND	2.4
Q427	10.1	2.5	10.8
Q428	2.5	GND	2.6
Q429	11.6	0	GND
Q430	1.3	8.8	1.3
Q431	3.8	GND	4.4
Q432	9.0	1.4	9.2
Q433	2.4	4.8	1.8
Q434	2.5	4.8	1.8
Q435	6.9	6.9	6.3
Q436	3.3	6.3	2.7
Q437	4.6	8.8	3.9
Q438	4.4	8.8	3.8
Q439	6.9	6.9	6.3
Q440	4.3	GND	4.8
Q441	1.1	2.5	0.5
Q442	3.3	6.3	2.5
Q443	6.3	8.8	5.6
Q444	0	0	0
Q445	4.4	8.1	3.8
Q446	5.0	8.8	4.5
Q447	3.9	GND	4.5
Q448	2.2	5.6	1.6
Q449	3.1	4.8	2.4
Q450	10.1	10.1	10.7
Q451	6.3	8.8	5.6
Q452	2.7	8.8	2.0
Q453	1.3	GND	1.7
Q454	3.1	4.8	2.5
Q455	4.7	8.8	4.0
Q456	-1.6	0	GND
Q457	3.0	4.8	2.5
Q458	5.4	8.8	4.7
Q459	2.5	GND	3.0
Q460	2.0	5.4	1.4
Q461	5.1	8.7	4.5
Q462	1.8	GND	2.5
Q463	5.7	8.8	5.1
Q464	2.1	6.2	1.5
Q465	2.6	4.8	2.0
Q466	6.2	8.8	5.6
Q467	1.0	GND	1.7
Q468	0.5	2.6	GND
Q469	0.5	2.6	GND
Q470	0.5	0	GND
Q471	0	0	0
Q472	0.6	0	GND
Q473	0	0	GND
Q474	0	0	GND
Q475	0.7	11.8	0
Q476	0	0	GND
Q477	0	0	GND
Q479	4.4	8.1	3.8
Q601	2.6	GND	3.2
Q602	3.8	3.2	4.6
Q603	0.8	2.0	0.3
Q604	2.5	0.9	3.0
Q605	2.0	GND	2.7
Q606	0.8	0.9	0.3
Q607	7.6	11.8	7.0

All voltages are in 'V.

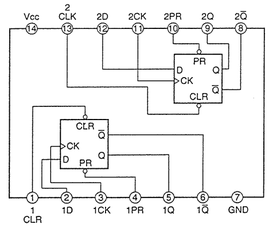
• B (3/4) BOARD WAVEFORMS



B (4/4) BOARD : IC801 LA7856A



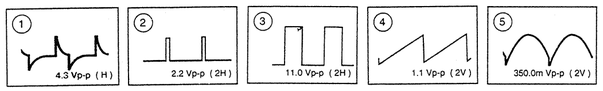
B (4/4) BOARD : IC802 MC74HC74AF-T2



B(4/4) BOARD ＊MARK LIST

	KP-46S4/46S4V/53S4/53S4U	KP-46S4K/53S4K
IC804	BA10358F-E2	LM358DR-EZ

• B (4/4) BOARD WAVEFORMS



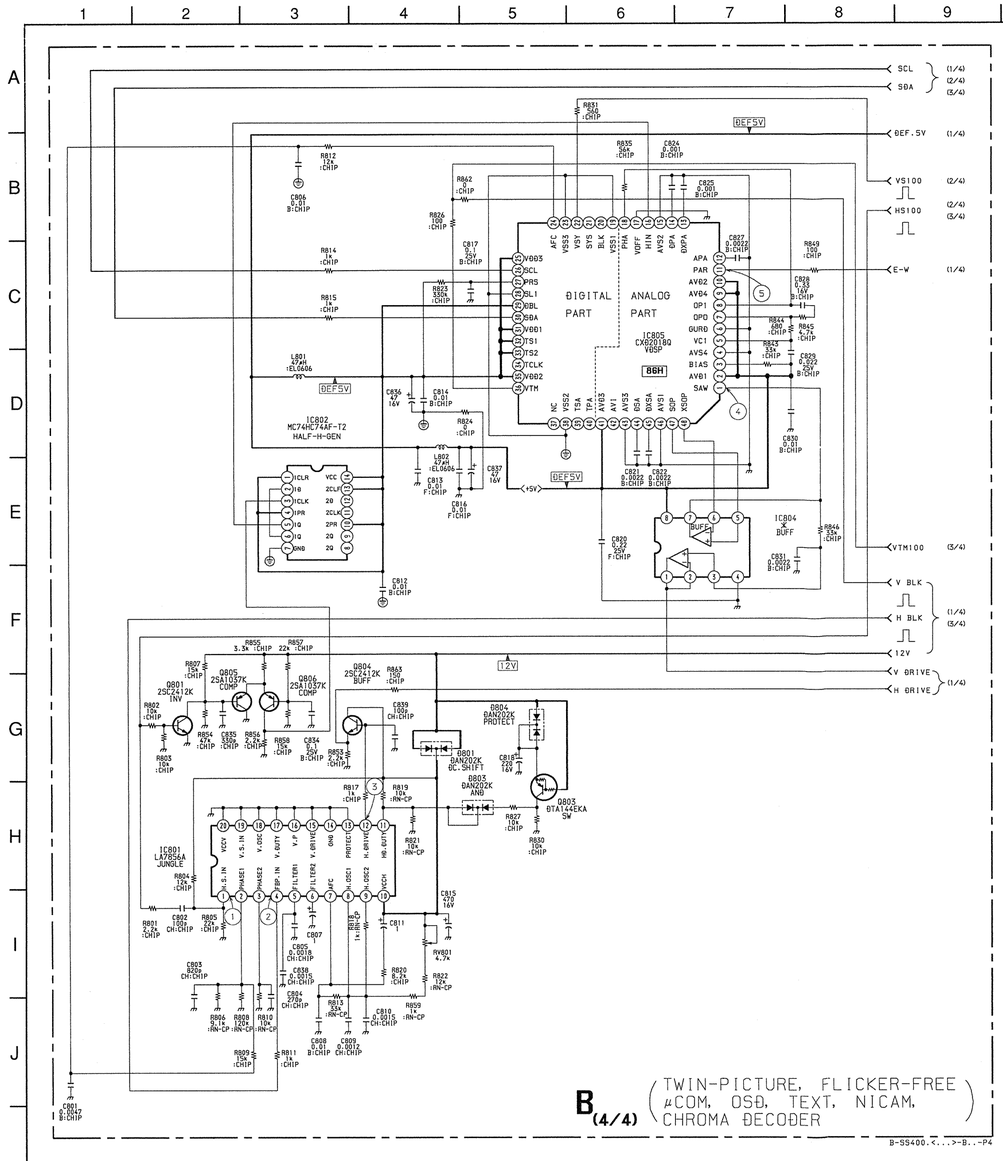
B BOARD

DIODE		＊
D1	C-10	⑤
D2	N-9	⑩
D3	N-9	⑩
D4	D-9	⑥
D5	K-10	④
D201	O-7	④
D203	C-6	⑤
D204	N-6	⑥
D205	M-7	④
D206	E-6	⑤
D207	L-6	④
D208	C-7	⑤
D209	C-7	⑤
D210	C-7	⑤
D211	D-6	⑤
D213	D-6	⑤
D214	F-6	⑥
D402	B-1	⑥
D403	N-2	⑥
D404	F-2	⑥
D405	N-4	⑥
D406	N-4	⑥
D407	O-5	⑥
D408	O-5	⑥
D410	B-5	⑥
D411	B-5	⑥
D412	B-5	⑥
D414	N-5	⑥
D415	M-5	⑥
D416	D-2	⑥
D417	O-6	⑥
D418	D-5	⑥
D419	L-5	⑥
D420	L-5	⑥
D421	K-5	⑥
D422	B-5	⑥
D424	E-2	⑥
D425	N-4	⑥
D426	B-3	⑥
D427	C-5	⑥
D801	G-5	⑥
D803	G-4	⑥
D804	G-4	⑤

IC		
IC1	M-9	⑥
IC2	M-9,C-9	⑥
IC3	C-10	⑥
IC4	D-10	⑥
IC5	E-10	⑥
IC6	N-8	⑥
IC7	F-10	⑥
IC8	J-9,F-9	⑥
IC9	B-8	⑥
IC10	O-10	⑥
IC201	D-6	⑥
IC202	C-8	⑥
IC203	N-6,B-6	⑥
IC204	B-7	⑥
IC206	D-8	⑥
IC207	E-7	⑥
IC210	B-6	⑥
IC212	E-8	⑥
IC213	E-6,K-6	⑥
IC214	N-7,C-7	⑥
IC215	M-7	⑥
IC216	L-6	⑥
IC217	M-7	⑥
IC218	F-8	⑥
IC219	L-6	⑥
IC221	J-7,F-7	⑥
IC222	L-6	⑥
IC401	N-1	⑥
IC402	B-1	⑥
IC403	F-2	⑥
IC404	C-2	⑥
IC405	B-2	⑥
IC406	N-2	⑥
IC407	D-1	⑥
IC408	M-4,C-4	⑥
IC409	N-4,B-4	⑥
IC410	B-5	⑥
IC411	C-5	⑥
IC412	E-5	⑥
IC413	O-3	⑥
IC414	E-5	⑥
IC415	E-2	⑥
IC601	L-4,D-4	⑥
IC801	I-5,G-5	⑥
IC802	F-5	⑥
IC804	F-5	⑥
IC805	F-4	⑥

TRANSISTOR		＊
Q1	N-9	①
Q2	N-9	①
Q3	D-10	②
Q4	D-10	②
Q5	D-9	②
Q6	L-9	①
Q7	N-9	①
Q8	N-8	①
Q9	D-9	②
Q10	D-9	②
Q11	D-10	②
Q12	B-8	②
Q13	N-9	①
Q14	B-8	②
Q15	N-10	①
Q16	B-10	②
Q17	K-5	①
Q18	K-9	①
Q19	K-9	①
Q20	N-9	①
Q21	N-10	①
Q22	K-10	①
Q23	B-8	②
Q24	K-10	①
Q25	B-8	②
Q26	O-9	①
Q27	O-9	①
Q28	O-10	①
Q29	O-9	①
Q30	A-10	②
Q31	O-10	①
Q32	A-10	②
Q34	O-10	①
Q35	B-10	②
Q36	C-9	②
Q37	C-9	②
Q38	E-9	②
Q39	D-9	②
Q40	L-9	①
Q41	M-9	①
Q42	F-9	①
Q43	L-9	①
Q201	A-7	②
Q202	O-8	①
Q204	N-7	①
Q206	O-8	①
Q207	A-7	②
Q208	D-8	②
Q209	B-7	②
Q210	N-6	①
Q211	D-6	②
Q212	D-6	②
Q213	F-6	②
Q214	C-7	②
Q215	D-6	②
Q216	F-6	②
Q217	F-6	②
Q218	J-6	①
Q219	K-6	①
Q220	K-6	①
Q401	J-1	①
Q402	J-1	①
Q403	G-1	①
Q404	I-1	①
Q405	G-1	②
Q406	G-2	②
Q407	J-2	①
Q408	J-2	①
Q409	N-2	①
Q410	O-2	①
Q411	N-2	①
Q412	B-2	②
Q413	K-3	①
Q414	J-2	①
Q415	J-2	①
Q416	K-2	①
Q417	G-1	②
Q418	J-1	①
Q419	B-5	②
Q420	N-5	①
Q421	A-5	②
Q422	A-5	②
Q423	A-5	②
Q424	N-4	①
Q425	O-4	①
Q426	O-4	①
Q427	N-5	①
Q428	O-5	①
Q429	I-2	①
Q430	N-5	①
Q431	N-5	①
Q432	O-5	①
Q433	E-4	②
Q434	E-4	②
Q435	M-5	①
Q436	M-5	①
Q437	L-5	①
Q438	D-5	②
Q439	M-5	①
Q440	L-5	①
Q441	M-5	①
Q442	M-5	①
Q443	M-5	①
Q444	H-3	②
Q445	O-3	②
Q446	D-5	②
Q447	L-5	①
Q448	M-4	①
Q449	F-4	②
Q450	N-5	①
Q451	M-5	①
Q452	D-5	②
Q453	C-5	②
Q454	K-5	①
Q455	O-5	①
Q456	I-2	①
Q457	E-5	②
Q458	L-5	①
Q459	K-5	①
Q460	D-4	②
Q461	A-4	②
Q462	E-5	②
Q463	O-4	①
Q464	D-5	②
Q465	E-4	②
Q466	D-5	②
Q467	D-4	②
Q468	A-4	②
Q469	A-4	②
Q470	A-4	②
Q471	E-1	②
Q472	M-1	②
Q473	E-2	②
Q474	E-2	②
Q475	L-4	①
Q476	E-1	②
Q477	E-1	②
Q479	G-3	②
Q601	D-5	②
Q602	D-5	②
Q603	L-3	①
Q604	D-5	②
Q605	L-3	①
Q606	D-5	②
Q607	L-3	①
Q801	G-5	②
Q803	G-4	②
Q804	G-4	②
Q805	J-6	①
Q806	J-6	①

VARIABLE RESISTOR		
RV1	K-9,E-9	
RV2	K-9,E-9	
RV801	J-4,G-4	



B(4/4) BOARD IC VOLTAGE LIST

	Pin	Voltages	Pin	Voltages
IC801	1	7.3	4	GND
	2	7.3	5	2.3
	3	7.8	6	GND
	4	0.4	7	2.3
	5	3.7	8	2.6
	6	2.9	9	5.0
	7	6.4	10	5.0
	8	5.9	11	2.3
	9	5.5	12	2.3
	10	11.3	13	1.7
	11	5.7	14	1.4
	12	4.5	15	GND
	13	GND	16	2.5
	14	GND	17	GND
	15	GND	18	2.6
	16	GND	19	GND
	17	GND	20	0.6
	18	GND	21	–
	19	GND	22	0
	20	GND	23	0
IC802	1	5.0	24	0.9
	2	2.5	25	5.0
	3	3.4	26	4.4
	4	5.0	27	4.8
	5	2.5	28	GND
	6	2.5	29	5.0
	7	GND	30	4.3
	8	–	31	5.0
	9	0.6	32	5.0
	10	5.0	33	5.0
	11	0.4	34	–
	12	0	35	5.0
	13	5.0	36	2.8
	14	5.0	37	–
IC804	1	1.9	38	GND
	2	1.9	39	–
	3	1.9	40	–
	4	GND	41	5.0
	5	1.8	42	–
	6	1.8	43	GND
	7	1.8	44	1.5
	8	5.0	45	1.5
IC805	1	1.9	46	GND
	2	5.0	47	1.8
	3	1.7	48	1.8

All voltages are in V.
–: Blank Pin

B(4/4) BOARD TRANSISTOR VOLTAGE LIST

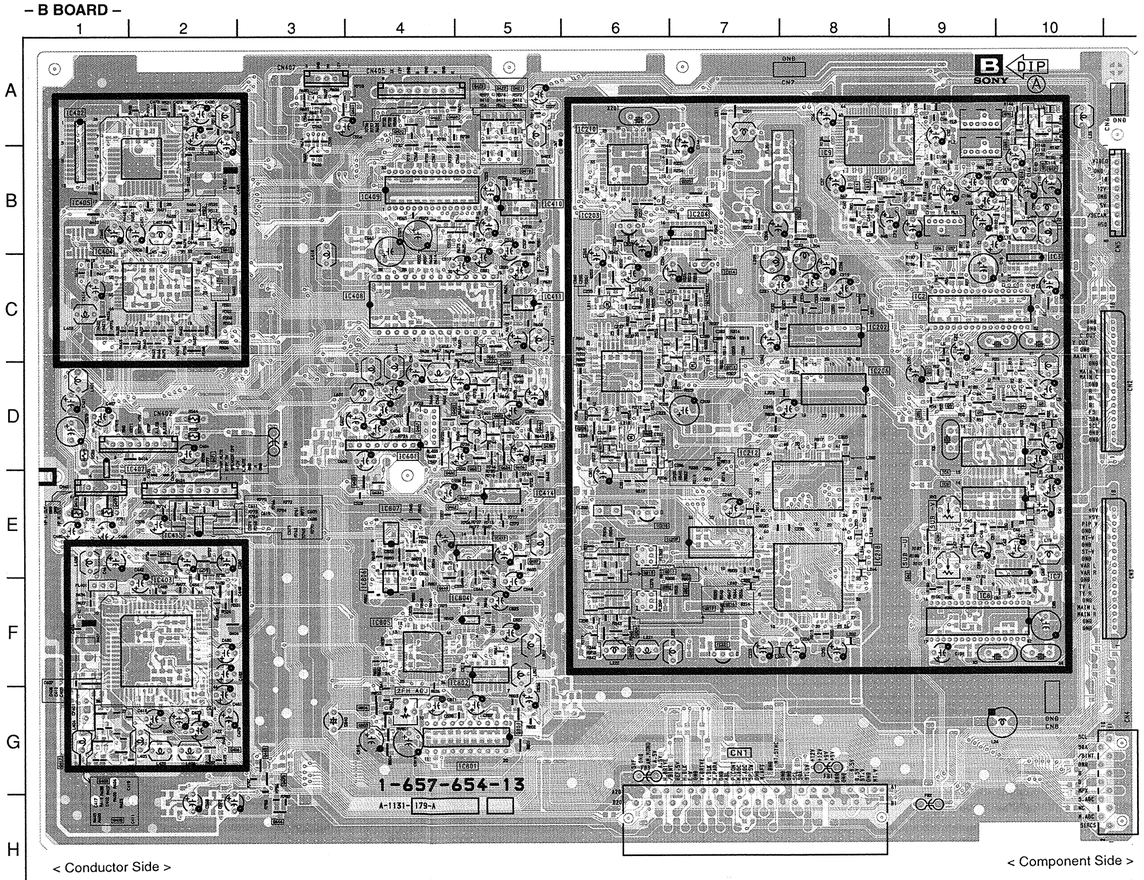
	B	C	E
Q801	0.1	6.9	GND
Q803	12.0	0	11.9
Q804	4.5	11.3	4.5
Q805	6.9	GND	4.8
Q806	4.9	3.4	4.8

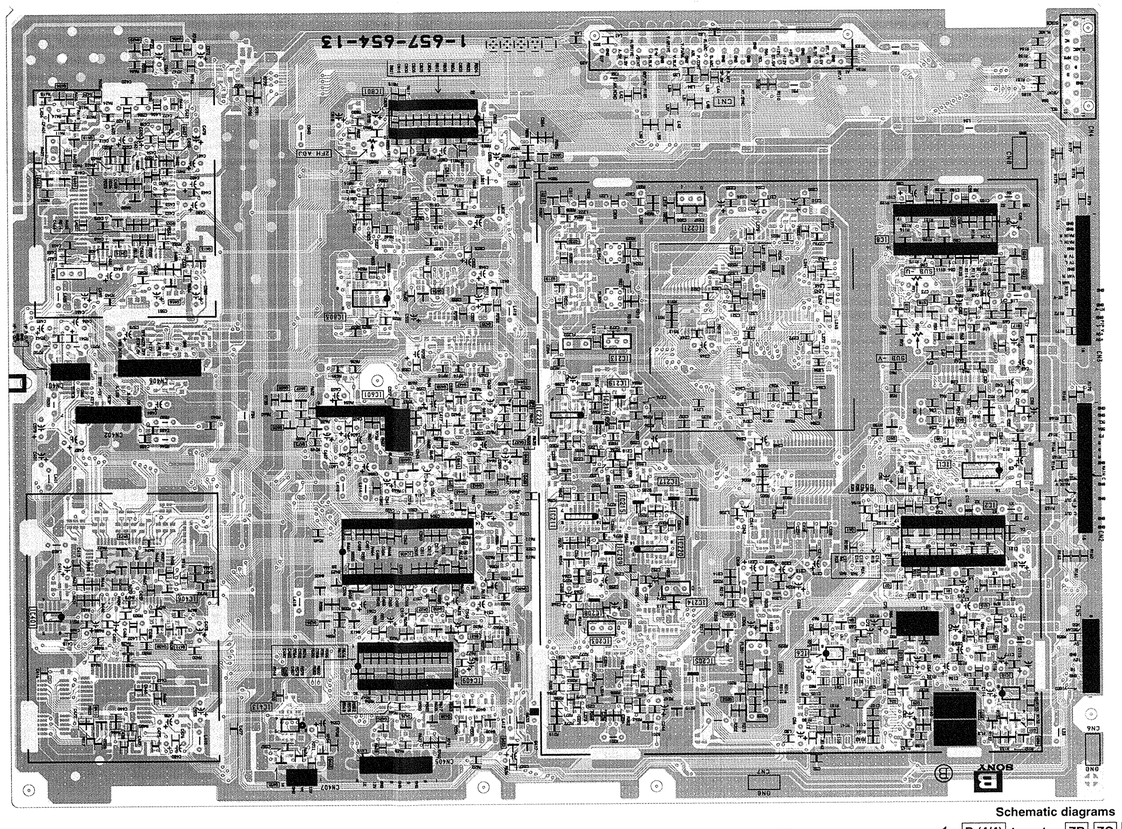
All voltages are in V.

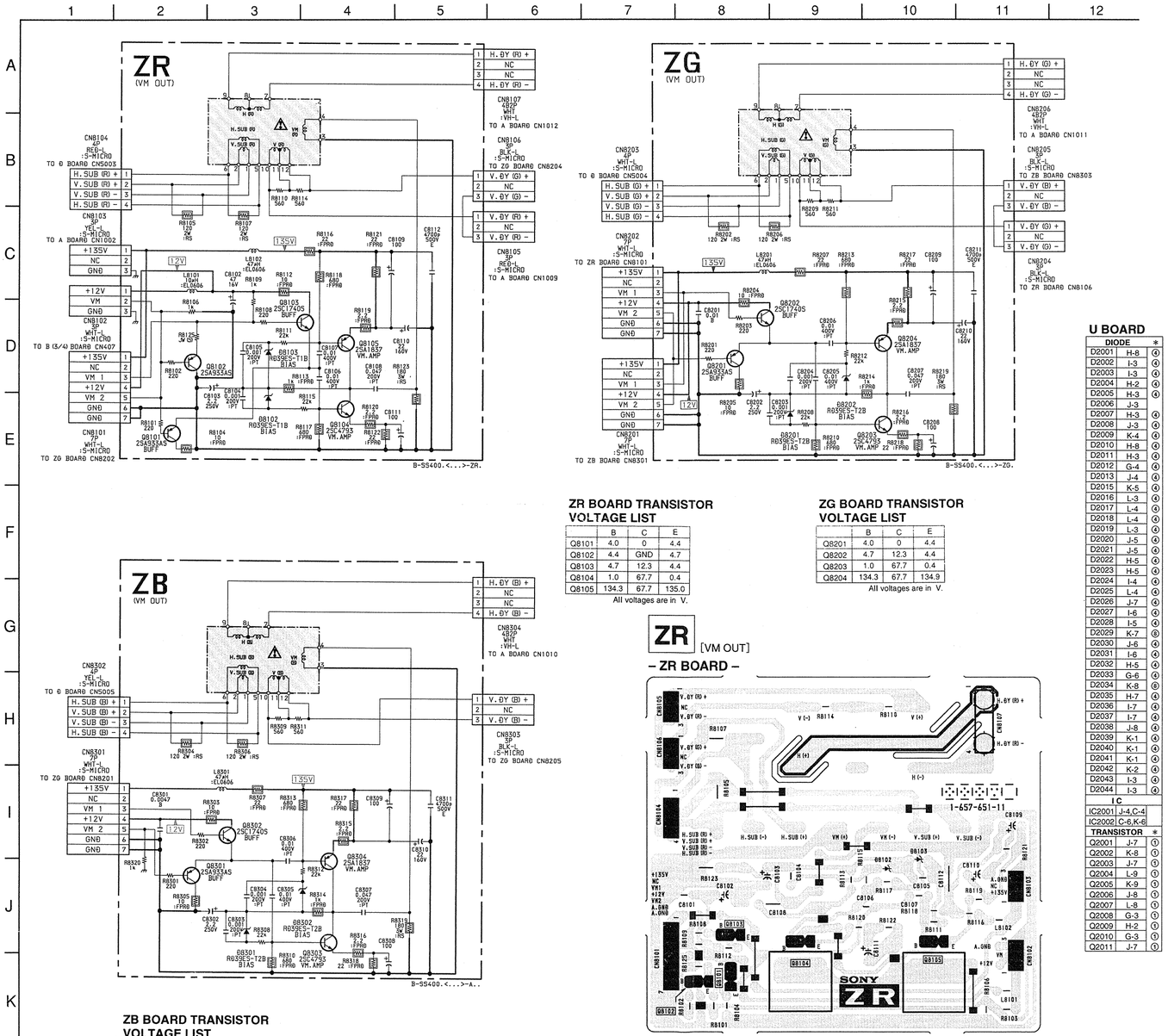
B [TWIN-PICTURE, FLICKER-FREE, μ COM, OSD, TEXT,NICAM, CHROMA DECODER]

NOTE:
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.

– B BOARD –







ZB BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q8301	4.0	0	4.4
Q8302	4.7	12.3	4.4
Q8303	1.0	67.7	0.4
Q8304	134.3	67.7	134.9

All voltages are in V.

ZR BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q8101	4.0	0	4.4
Q8102	4.4	GND	4.7
Q8103	4.7	12.3	4.4
Q8104	1.0	67.7	0.4
Q8105	134.3	67.7	135.0

All voltages are in V.

ZG BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q8201	4.0	0	4.4
Q8202	4.7	12.3	4.4
Q8203	1.0	67.7	0.4
Q8204	134.3	67.7	134.9

All voltages are in V.

ZR [VM OUT]

– ZR BOARD –

ZG [VM OUT]

– ZG BOARD –

ZB [VM OUT]

– ZB BOARD –

U BOARD

	DIODE	*
D2001	H-8	④
D2002	I-3	④
D2003	I-3	④
D2004	H-2	④
D2005	H-3	④
D2006	J-3	④
D2007	H-3	④
D2008	J-3	④
D2009	K-4	④
D2010	H-8	④
D2011	H-3	④
D2012	G-4	④
D2013	J-4	④
D2015	K-5	④
D2016	L-3	④
D2017	L-4	④
D2018	L-4	④
D2019	L-3	④
D2020	J-5	④
D2021	J-5	④
D2022	H-5	④
D2023	H-5	④
D2024	I-4	④
D2025	L-4	④
D2026	J-7	④
D2027	I-6	④
D2028	I-5	④
D2029	K-7	④
D2030	J-6	④
D2031	I-6	④
D2032	H-5	④
D2033	G-8	④
D2034	K-8	④
D2035	H-7	④
D2036	I-7	④
D2037	I-7	④
D2038	J-8	④
D2039	K-1	④
D2040	K-1	④
D2041	K-1	④
D2042	K-2	④
D2043	I-3	④
D2044	I-3	④

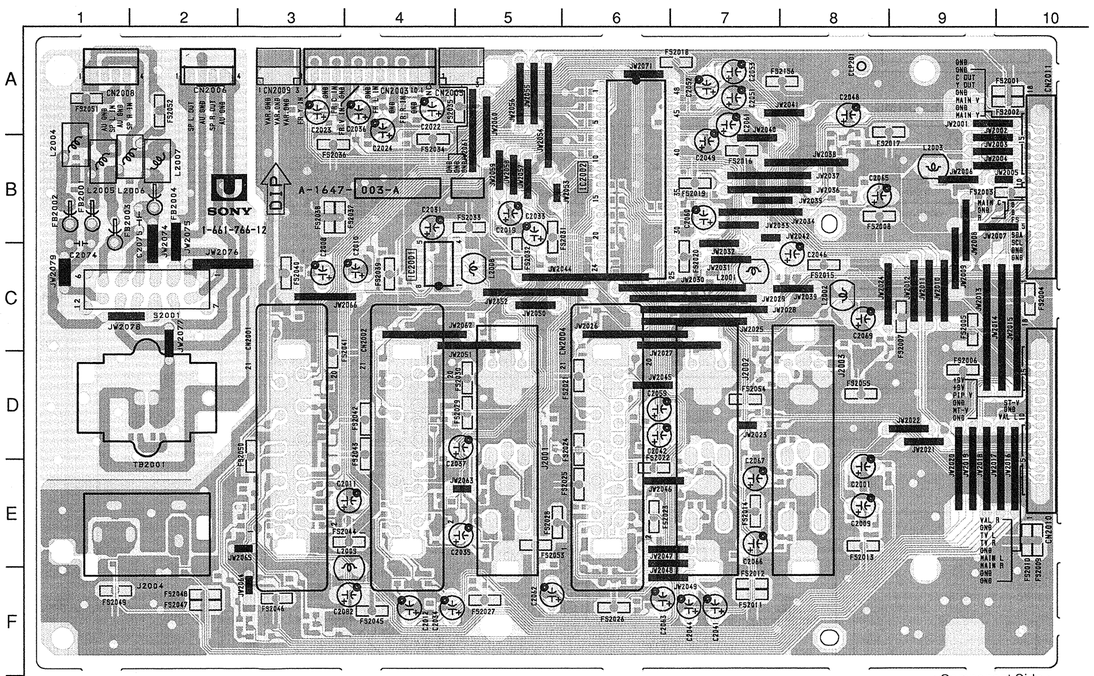
	IC
IC2001	J-4,C-4
IC2002	C-6,K-6

	TRANSISTOR	*
Q2001	J-7	①
Q2002	K-8	①
Q2003	J-7	①
Q2004	L-9	①
Q2005	K-9	①
Q2006	J-8	①
Q2007	L-8	①
Q2008	G-3	①
Q2009	H-2	①
Q2010	G-3	①
Q2011	J-7	①

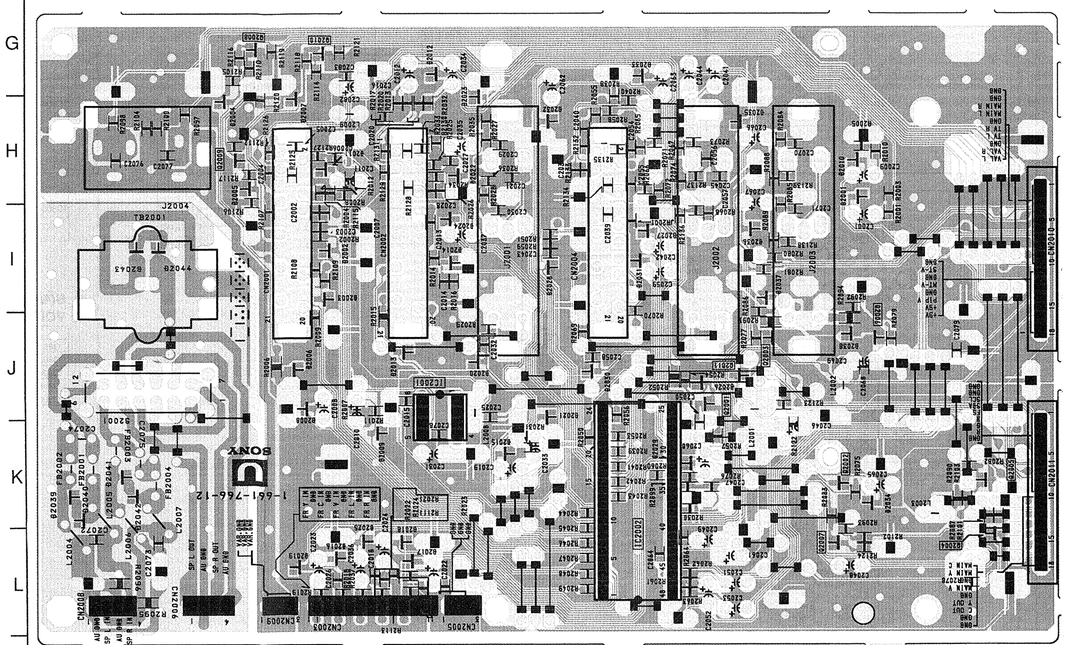
U [A/V SWITCH, P IN P, AV-INPUT/OUTPUT, AUDIO LINE OUTPUT]

– U BOARD –

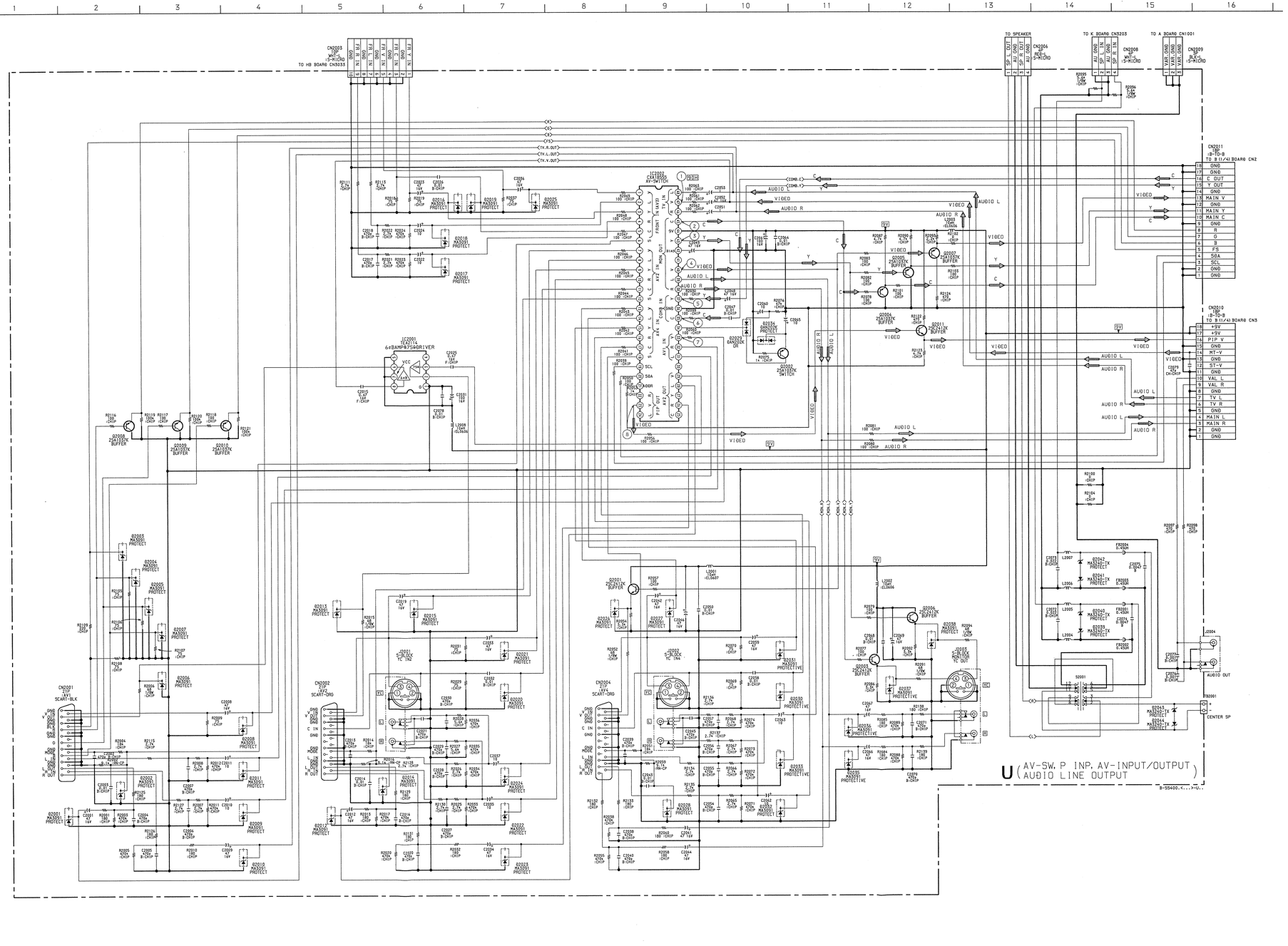
NOTE:
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.



< Component Side >



< Conductor Side >



U BOARD IC VOLTAGE LIST

	Pin	Voltages
IC2001	1	GND
	2	2.0
	3	2.7
	5	8.8
	6	1.8
	7	8.8
	8	2.2
IC2002	1	4.5
	2	4.5
	3	4.5
	4	4.5
	5	4.5
	6	0
	7	4.5
	8	4.5
	9	4.5
	10	4.5
	11	4.5
	12	0
	13	4.5
	14	4.5
	15	4.5
	16	4.5
	17	4.5
	18	0
	19	4.8
	20	4.8
	21	0
	22	–
	23	4.5
	24	–
	25	–
	26	4.5
	27	–
	28	4.5
	29	4.5
	30	–
	31	4.5
	32	4.5
	33	4.5
	34	0.5
	36	4.5
	36	GND
	37	4.5
	38	4.5
	39	4.5
	40	4.5
	41	–
	42	4.5
	43	4.5
	44	8.8
	45	8.8
	46	8.8
	47	8.8
	48	8.8

All voltages are in V.
–: Blank Pin

U BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q2001	4.4	8.8	3.8
Q2002	8.8	1.2	8.6
Q2003	4.5	8.8	3.9
Q2004	4.5	GND	5.1
Q2005	4.5	GND	5.1
Q2006	4.4	8.8	3.8
Q2007	4.4	0.8	5.0
Q2008	0	GND	0
Q2009	0	GND	0
Q2010	0	GND	0
Q2011	0	3.8	0

All voltages are in V.

• U BOARD WAVEFORMS

① 1.4Vp-p (H)

② 1.7Vp-p (H)

③ 2.5Vp-p (H)

④ 2.8Vp-p (H)

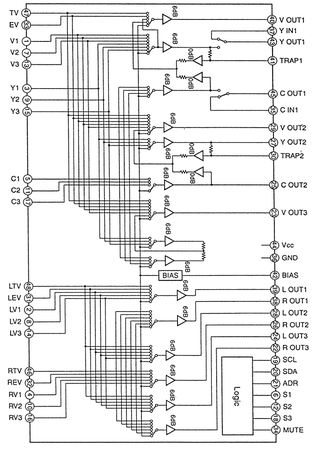
⑤ 2.5Vp-p (H)

⑥ 1.5Vp-p (H)

⑦ 2.6Vp-p (H)

⑧ 2.5Vp-p (H)

U BOARD : IC2002 CXA1855S



D BOARD TRANSISTORE VOLTAGE LIST

	B	C	E
Q5001	0	5.7	GND
Q5002	-3.2	-5.0	-2.6
Q5003	2.5	5.1	1.9
Q5004	0	5.0	GND
Q5101	0	3.5	GND
Q5102	0	3.3	GND
Q5401	0	4.8	GND
Q5411	0	5.7	GND

All voltages are in V.

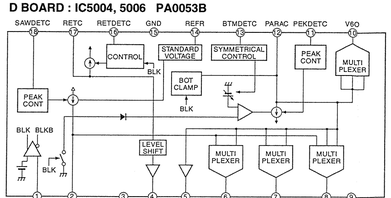
D BOARD IC VOLTAGE LIST

	Pin	Voltages		Pin	Voltages		Pin	Voltages		Pin	Voltages		Pin	Voltages
IC5001	21	5.1		32	0		27	0		25	0		14	0.3
	24	5.0		33	5.0		28	0		26	0		15	1.8
	30	0		34	5.0		29	0		27	0		16	5.0
	31	0		35	0		30	-0.6		28	0	IC5501	1	20.8
	32	GND		36	0		31	5.0		29	0		2	20.8
	34	2.5		37	0		32	0		30	-0.6		3	20.8
	35	2.2		38	0		33	5.0		31	5.0		4	0
	36	5.1		39	0		34	5.0		32	0		5	0
	39	GND		40	0		35	0		33	5.0		6	-0.2
	40	GND		41	0		36	0		34	5.0		7	-0.2
	41	GND		42	GND		37	0		35	0		8	GND
	42	GND	IC5003	1	5.1		38	0		36	0		9	-0.2
	43	5.1		2	5.1		39	0		37	0		10	-0.2
	44	4.7		3	GND		40	0		38	0		11	22.2
	46	0	IC5004	1	0.8		41	0		39	0		12	-21.8
	47	0		2	1.1		42	GND		40	0		13	-21.8
	48	0		3	5.1	IC5006	1	0.8		41	0		14	22.2
	54	4.5		4	0		2	1.1		42	GND		15	22.4
	56	4.6		5	-1.0		3	5.1	IC5008	1	0.5		16	21.9
	58	0		6	0		4	0		2	0		17	21.9
	59	0		7	-0.8		5	-1.0		3	GND		18	22.4
	60	0		9	-5.0		6	0		4	5.1		19	-21.9
	61	GND		10	0.1		7	-0.8		5	0		20	-0.5
	62	GND		11	0.4		9	-5.0		6	0		21	-0.3
	63	5.1		12	-1.0		10	0.1		7	0		22	0
	64	5.1		13	0.3		11	0.4		8	0	IC5502	1	20.8
IC5002	1	0		14	1.2		12	-1.0		9	0		2	20.8
	2	-1.0		15	GND		13	0.3		10	0		3	20.8
	3	0		16	-1.2		14	-1.2		11	-5.0		4	0
	4	-0.8		17	1.9		15	GND		12	GND		5	0
	5	0		18	-1.2		16	-1.2		13	0		6	-0.2
	6	-0.4	IC5005	1	0		17	1.9		14	0		7	-0.2
	7	0		2	-1.0		18	-1.2	IC5009	1	0.3		8	GND
	8	5.0		3	0	IC5007	1	0		2	0		9	-0.2
	9	-5.0		4	-0.8		2	-1.0		3	GND		10	-0.2
	10	5.0		5	0		3	0		4	5.0		11	22.2
	11	5.0		6	-0.4		4	-0.8		5	GND		12	-21.8
	12	0		7	5.0		5	0		6	0		13	-21.8
	13	5.0		8	5.0		6	-0.4		7	0		14	22.2
	14	-2.2		9	-5.0		7	-5.0		8	0		15	22.4
	15	0		10	5.0		8	5.0		9	0		16	21.9
	16	-0.9		11	5.0		9	-5.0		10	0		17	21.9
	17	0		12	0		10	5.0		11	-5.0		18	22.4
	18	-1.1		13	5.0		11	5.0		12	0		19	-21.9
	19	0		14	-2.2		12	0		13	0		20	-0.5
	20	-0.4		15	0		13	5.0		14	0		21	-0.3
	21	5.0		16	-0.9		14	-2.2	IC5101	1	GND		22	0
	22	0.3		17	0		15	0		2	0	IC5601	1	10.6
	23	0		18	-1.1		16	-0.9		3	5.0		G	GND
	24	0		19	0		17	0		4	3.4		O	5.1
	25	0		20	-0.4		18	-1.1		6	2.5	IC5602	I	11.1
	26	0		21	5.0		19	0		7	1.4		G	GND
	27	0		22	0		20	-0.4		8	GND		O	-5.0
	28	0		23	0		21	5.0		9	GND			
	29	0		24	0		22	0		10	3.4			
	30	-0.6		25	0		23	0		11	5.1			
	31	5.0		26	0		24	0		12	0.8			

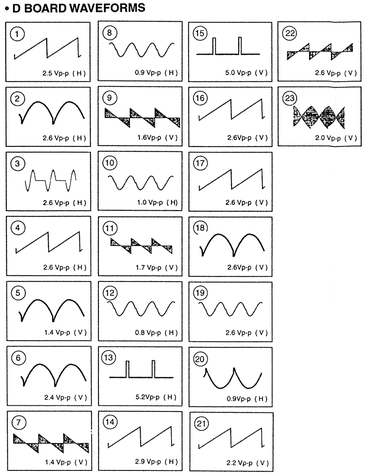
All voltages are in V.

Pin numbers which are not described are not used.

D BOARD : IC5004, 5006 PA0053B

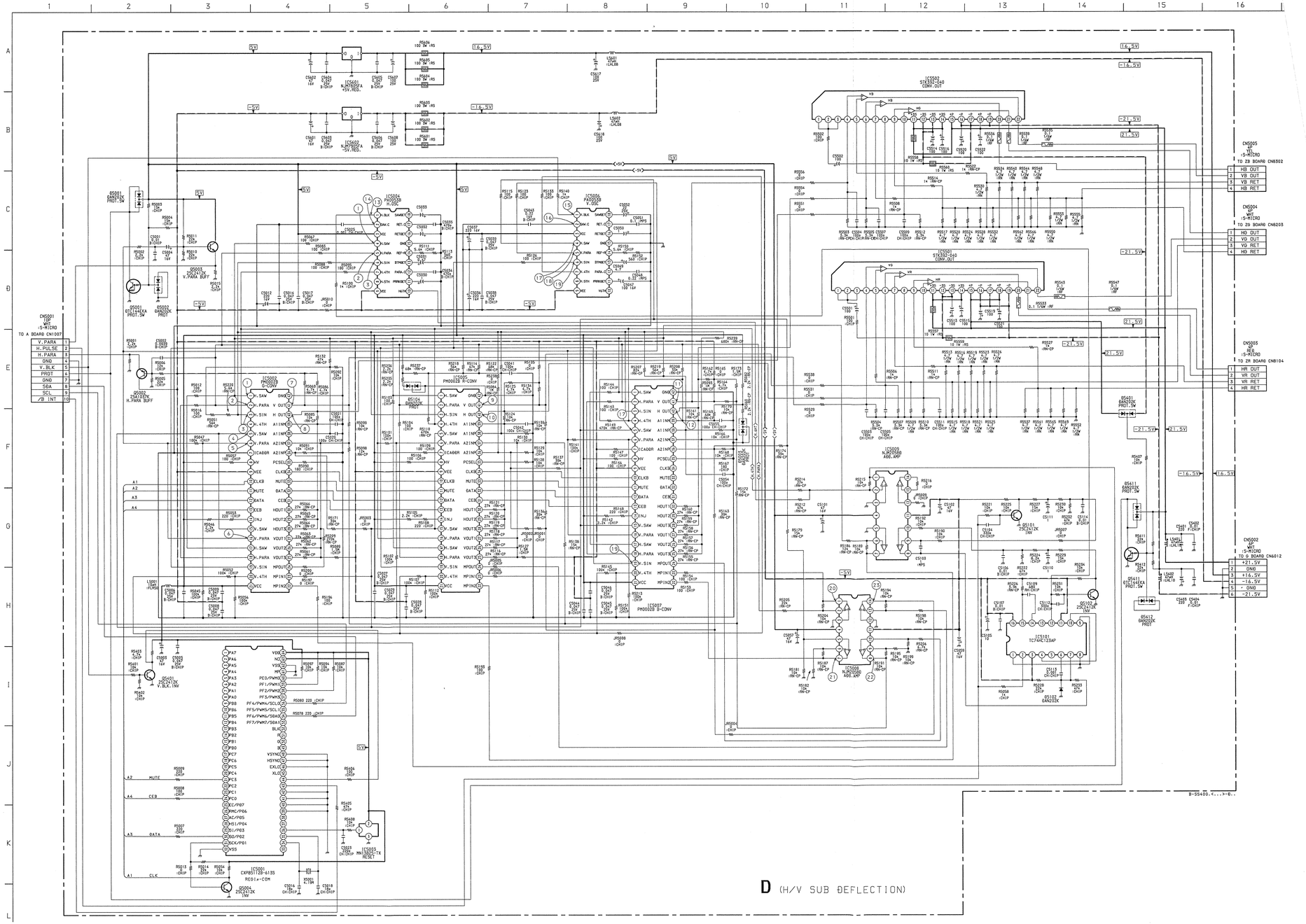


• D BOARD WAVEFORMS



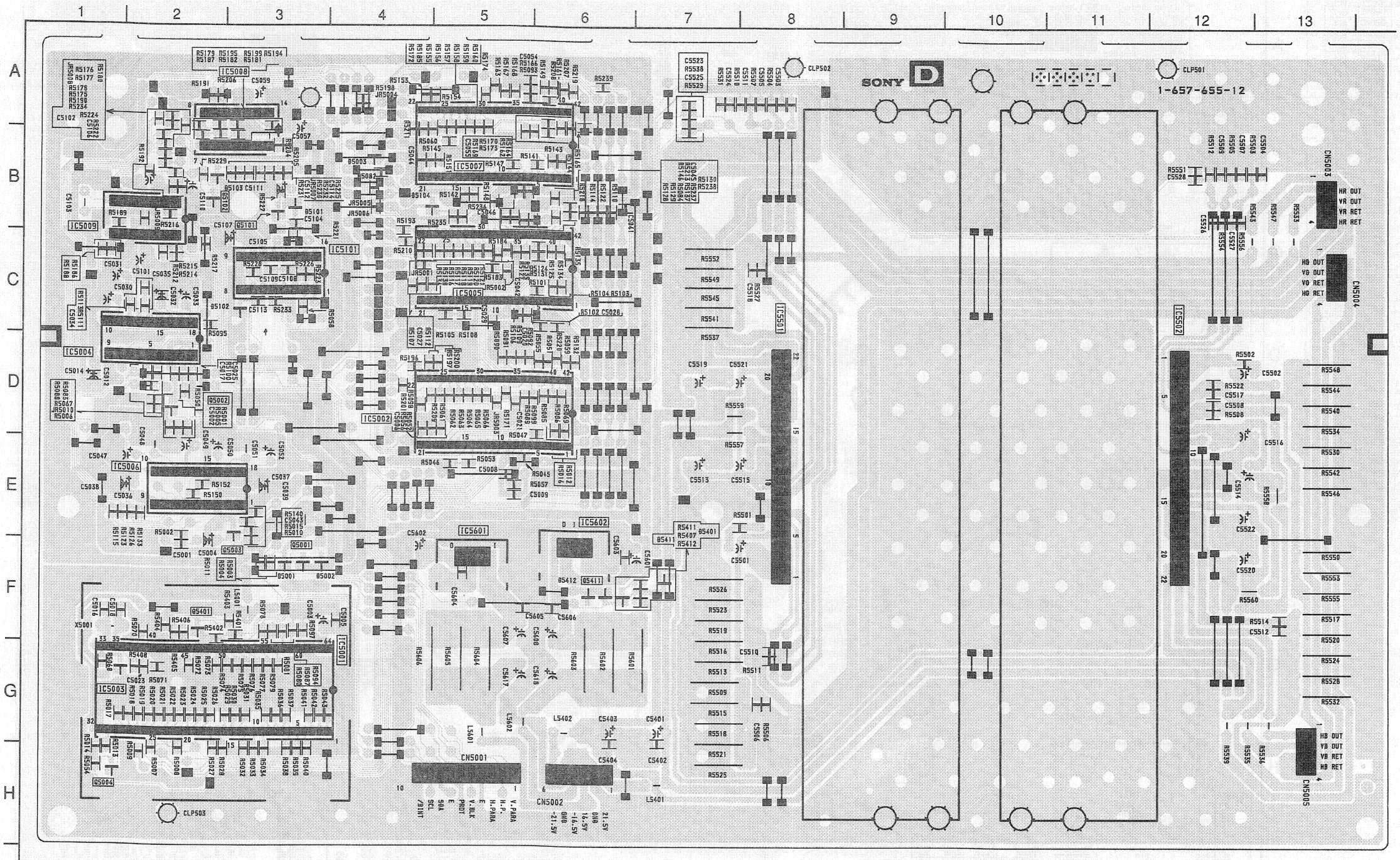
Schematic diagrams

← U board D board →



D [H/V SUB DEFLECTION]

– D BOARD –



D BOARD

DIODE		*
D5001	F-3	⑥
D5002	F-3	⑥
D5003	B-4	⑥
D5102	C-3	⑥
D5104	B-4	⑥
D5401	F-7	⑥
D5411	F-6	⑥
D5412	F-6	⑥
IC		
IC5001	F-3	
IC5002	D-5	
IC5003	G-2	
IC5004	D-2	
IC5005	C-5	
IC5006	E-2	
IC5007	B-5	
IC5008	B-3	
IC5009	B-2	
IC5101	C-3	
IC5501	E-8	
IC5502	E-12	
IC5601	F-5	
IC5602	F-6	
TRANSISTOR		*
Q5001	F-3	①
Q5002	D-2	①
Q5003	E-3	①
Q5004	H-1	①
Q5101	B-3	①
Q5102	B-2	①
Q5401	F-2	①
Q5411	F-6	①

G BOARD

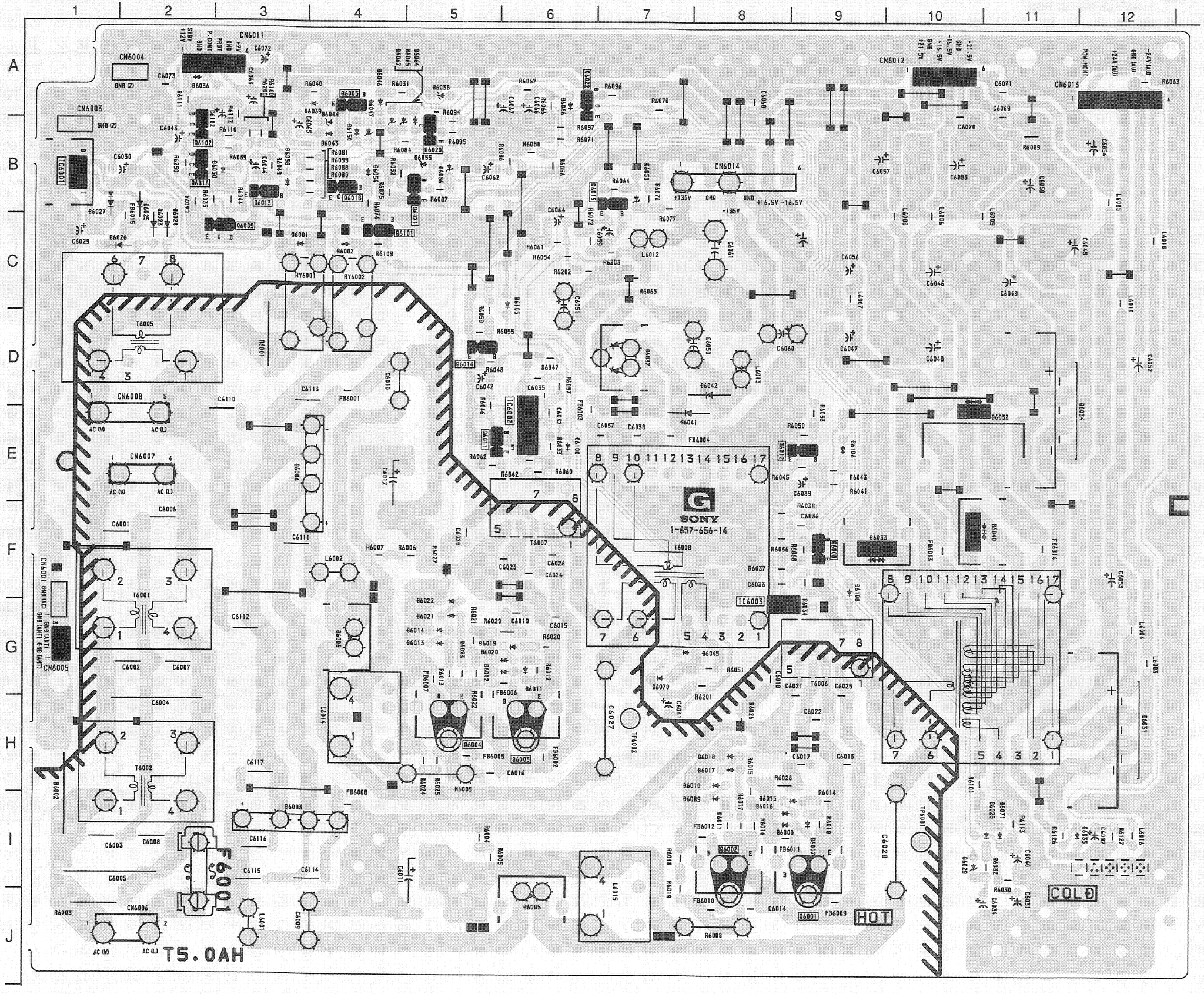
DIODE		*
D6001	C-3	–
D6002	C-4	–
D6003	I-3	–
D6004	E-4	–
D6005	J-6	–
D6006	G-4	–
D6007	I-9	–
D6008	I-8	–
D6009	I-8	–
D6010	H-8	–
D6011	G-6	–
D6012	G-6	–
D6013	G-5	–
D6014	G-5	–
D6015	I-9	–
D6016	I-8	–
D6017	H-8	–
D6018	H-8	–
D6019	G-6	–
D6020	G-6	–
D6021	G-5	–
D6022	G-5	–
D6023	C-2	–
D6024	C-2	–
D6025	B-2	–
D6026	C-1	–
D6027	B-1	–
D6028	I-10	–
D6029	I-10	–
D6030	B-3	–
D6031	H-12	–
D6032	E-10	–
D6033	F-9	–
D6035	I-11	–
D6036	A-2	–
D6037	D-7	–
D6038	A-5	–
D6039	A-4	–
D6040	F-10	–
D6041	E-7	–
D6042	D-8	–
D6043	B-4	–
D6044	B-4	–
D6045	G-7	–
D6046	A-4	–
D6047	B-4	–
D6050	B-7	–
D6054	B-4	–
D6055	B-5	–
D6056	B-5	–
D6058	B-3	–
D6064	B-5	–
D6065	B-4	–
D6066	A-6	–
D6067	B-4	–
D6070	G-7	–
D6100	E-6	–
D6105	D-6	–
D6106	E-9	–
D6108	F-9	–
D6150	B-4	–

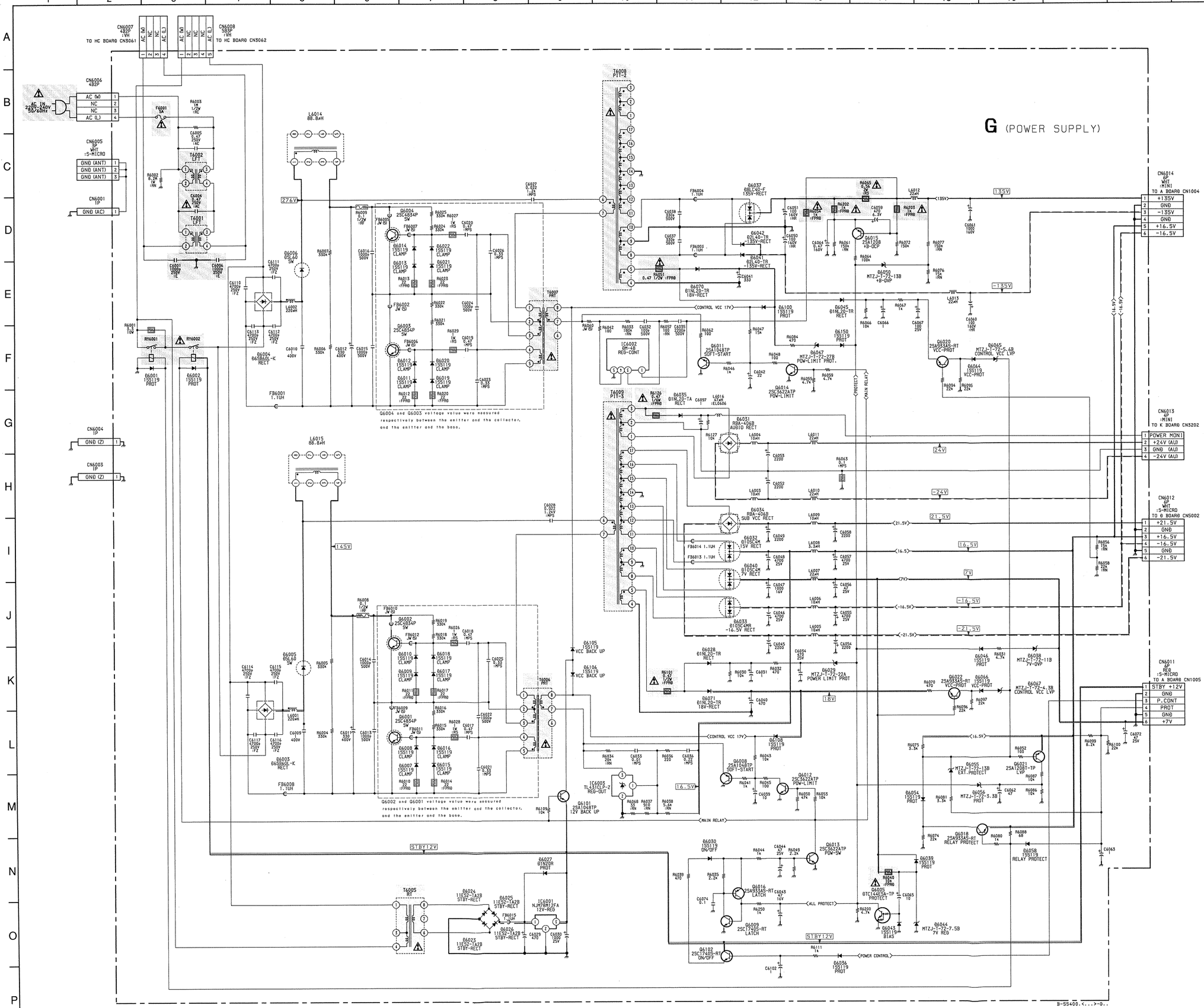
IC	
IC6001	B-1
IC6002	E-6
IC6003	G-8

TRANSISTOR		*
Q6001	J-9	–
Q6002	I-8	–
Q6003	H-6	–
Q6004	H-5	–
Q6005	A-4	–
Q6008	F-9	–
Q6009	C-3	–
Q6011	E-5	–
Q6012	E-9	–
Q6013	B-3	–
Q6014	D-5	–
Q6015	B-7	–
Q6016	B-2	–
Q6018	B-4	–
Q6020	B-5	–
Q6021	B-5	–
Q6022	A-6	–
Q6101	C-4	–
Q6102	B-2	–

– G BOARD –

G [POWER SUPPLY]





G BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q6001	-2.0	144.8	0
Q6002	143.1	284.8	145.5
Q6003	-1.6	141.5	0
Q6004	139	276.6	140.0
Q6005	0.2	0	GND
Q6008	15.9	GND	14.1
Q6009	0.7	2.5	GND
Q6011	14.8	GND	13.2
Q6012	0	16.1	GND
Q6013	0.8	0.1	GND
Q6014	0	15.0	GND
Q6015	134.8	0.2	135.2
Q6016	2.5	0.7	2.5
Q6018	16.2	16.9	16.9
Q6020	15.1	15.6	15.7
Q6021	16.9	0	16.9
Q6022	15.3	16.0	16.0
Q6101	11.1	11.8	11.8
Q6102	4.7	11.8	4.1

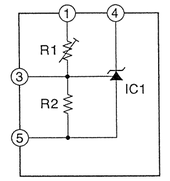
All voltages are in V.

G BOARD IC VOLTAGE LIST

	Pin	Voltages
IC6001	1	14.4
	2	GND
	3	11.8
IC6002	1	135.9
	2	–
	3	0.3
	4	0.3
	5	GND
IC6003	1	2.5
	2	GND
	3	14.3

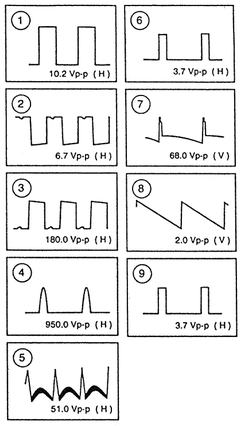
All voltages are in V.
–: Blank Pin

G BOARD : IC6002 DM-48



Schematic diagrams
← G board A board →

• A BOARD WAVEFORMS



A BOARD TRANSISTORE VOLTAGE LIST

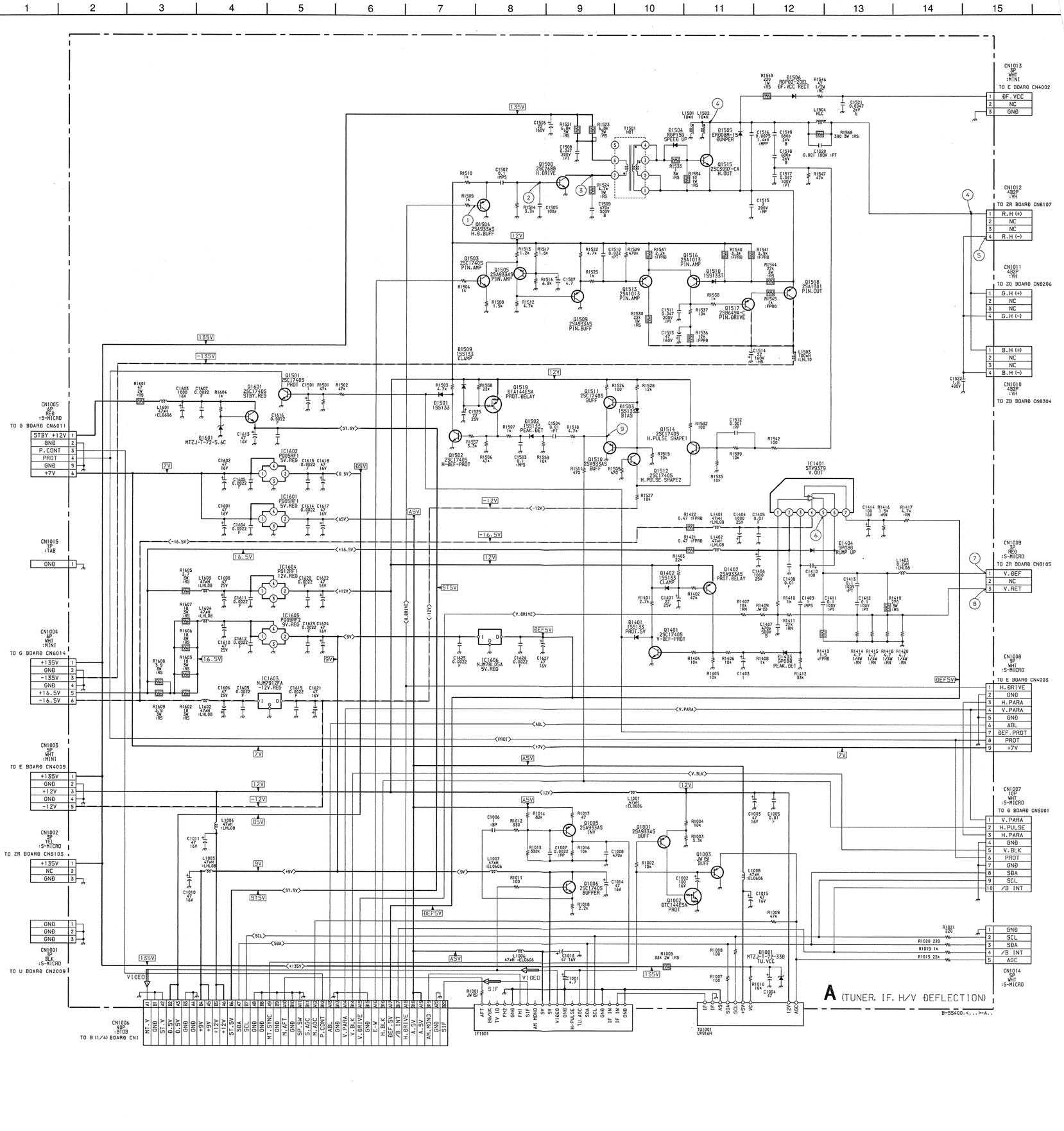
	B	C	E
Q1001	4.0	0	2.9
Q1002	0	0	GND
Q1003	4.0	GND	4.6
Q1005	4.6	0.8	4.9
Q1006	4.6	8.7	4.0
Q1401	0.7	0.1	GND
Q1402	12.3	2.4	12.3
Q1501	0	0	GND
Q1502	0.7	0.1	GND
Q1503	2.4	10.4	1.8
Q1504	3.9	GND	4.6
Q1505	9.8	2.3	10.4
Q1508	-2.9	88.3	GND
Q1509	2.3	GND	3.0
Q1510	0.3	GND	0.9
Q1511	1.5	12.3	0.9
Q1512	0	0.3	0
Q1513	2.9	-65.8	3.5
Q1514	0	12.3	0
Q1515	-122.7	1.1	-122.4
Q1516	3.0	-114.4	3.5
Q1517	-114.3	-137.1	-118.0
Q1518	-116.7	-137.1	-122.4
Q1519	12.3	0.8	12.3
Q1601	5.9	10.3	5.0

All voltages are in V.

A BOARD IC VOLTAGES LIST

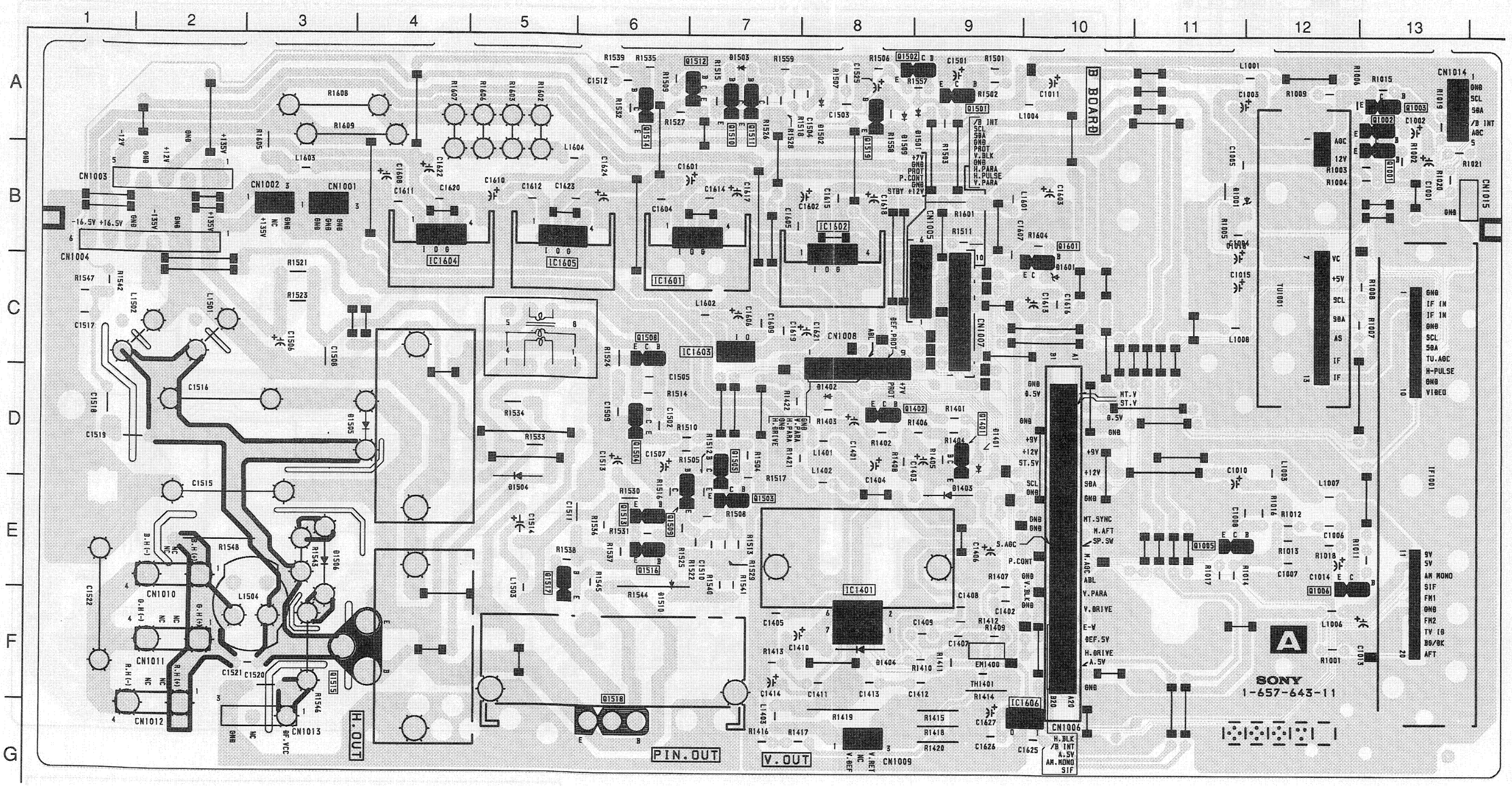
	Pin	Voltages
IC1401	1	1.1
	2	16.5
	3	-15.6
	4	-17.2
	5	0.7
	6	16.2
	7	1.2
IC1601	1	8.3
	2	5.0
	3	GND
	4	8.3
IC1602	1	8.3
	2	5.0
	3	GND
	4	8.3
IC1603	I	-17.5
	G	GND
	O	-12.0
IC1604	1	15.6
	2	12.3
	3	GND
	4	15.6
IC1605	1	12.2
	2	9.0
	3	GND
	4	12.2
IC1606	I	9.0
	G	GND
	O	5.0

All voltages are in V.



A [TUNER, IF, H/V DEFLECTION]

– A BOARD –



A BOARD

DIODE		*
D1001	B-12	-
D1401	D-9	-
D1402	D-8	-
D1403	E-9	-
D1404	F-8	-
D1501	A-9	-
D1502	A-8	-
D1503	A-7	-
D1504	E-5	-
D1505	D-4	-
D1506	E-3	-
D1509	A-8	-
D1510	E-6	-
D1601	C-10	-
I C		
IC1401	F-8	
IC1601	B-7	
IC1602	B-8	
IC1603	C-7	
IC1604	B-4	
IC1605	B-5	
IC1606	G-10	
TRANSISTOR		*
Q1001	A-13	-
Q1002	A-13	-
Q1003	A-13	-
Q1005	E-11	-
Q1006	E-12	-
Q1401	D-9	-
Q1402	D-8	-
Q1501	A-9	-
Q1502	A-9	-
Q1503	E-7	-
Q1504	D-6	-
Q1505	D-7	-
Q1508	C-6	-
Q1509	E-6	-
Q1510	A-7	-
Q1511	A-7	-
Q1512	A-7	-
Q1513	E-6	-
Q1514	A-6	-
Q1515	F-4	-
Q1516	E-6	-
Q1517	E-5	-
Q1518	G-6	-
Q1519	A-8	-
Q1601	C-10	-

E HV-REGULATOR, DYNAMIC FOCUS

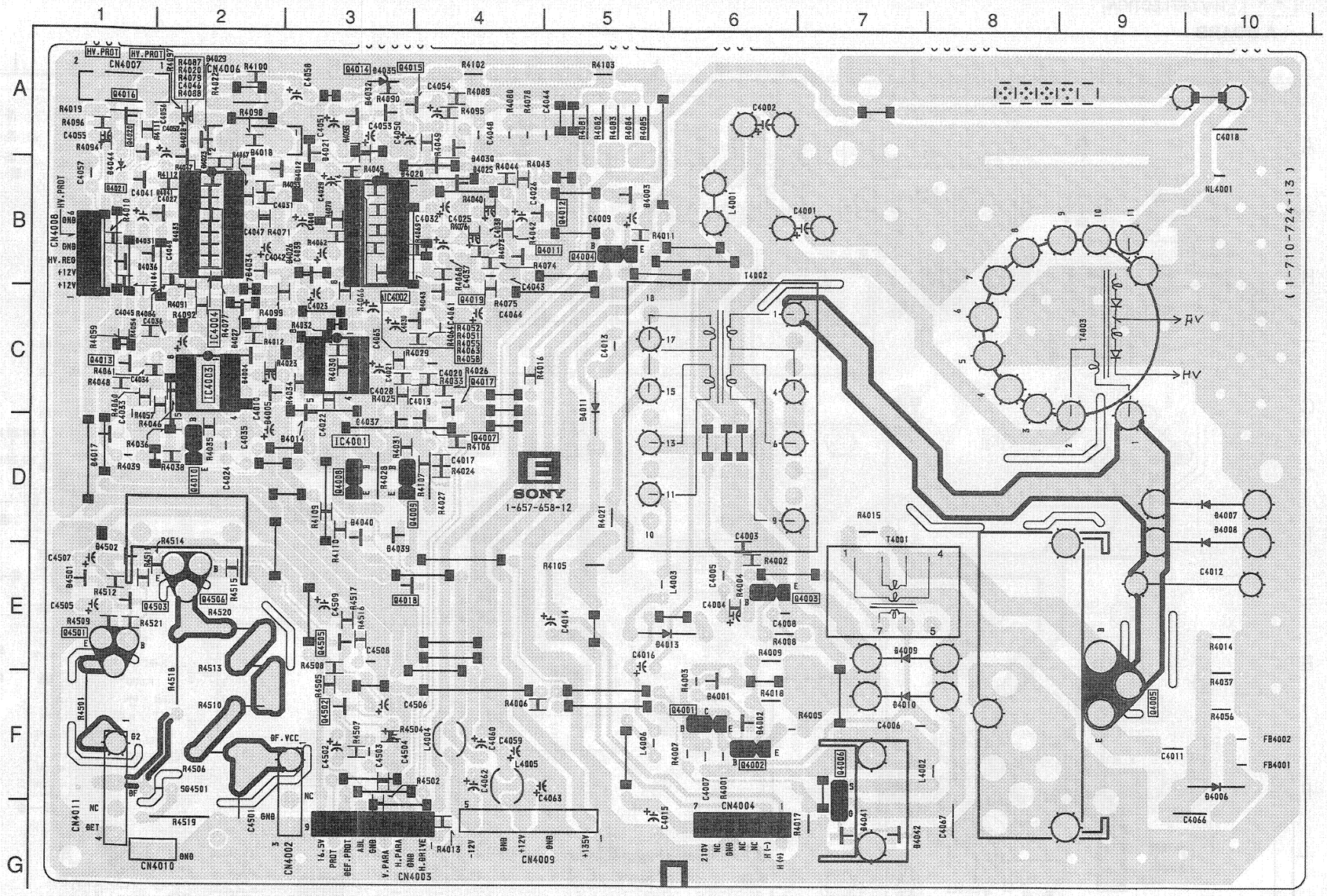
– E BOARD –

E BOARD

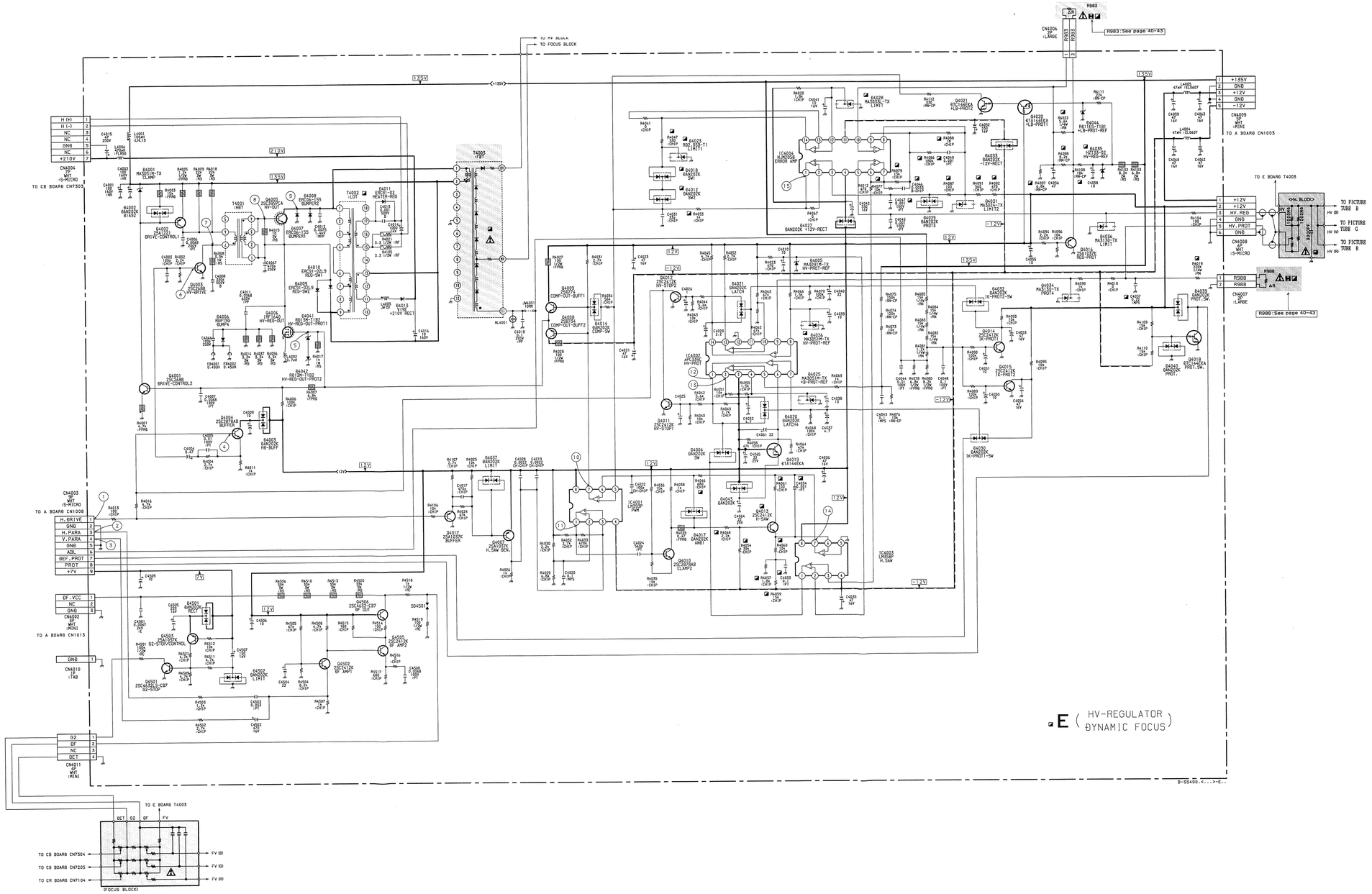
DIODE		*
D4001	F-6	④
D4002	F-6	⑧
D4003	B-5	⑧
D4004	C-2	⑧
D4005	C-2	④
D4006	F-10	–
D4007	D-10	–
D4008	D-10	–
D4009	F-7	–
D4010	F-7	–
D4011	C-5	–
D4012	B-2	⑧
D4013	E-5	④
D4014	C-3	⑧
D4017	D-1	⑧
D4018	B-2	⑧
D4020	B-4	⑧
D4021	A-3	⑧
D4023	B-2	④
D4025	B-4	④
D4026	B-3	④
D4027	C-2	⑧
D4028	A-2	④
D4029	A-2	⑤
D4030	A-4	⑧
D4031	B-1	④
D4032	A-3	⑧
D4033	B-2	⑤
D4034	B-2	④
D4035	A-3	–
D4036	B-1	④
D4037	D-3	⑤
D4039	D-3	⑧
D4040	D-3	⑧
D4041	G-7	④
D4042	G-7	④
D4043	C-4	⑧
D4044	B-1	–
D4501	E-1	⑧
D4502	E-1	⑧

IC	
IC4001	C-3
IC4002	B-3
IC4003	C-2
IC4004	B-2

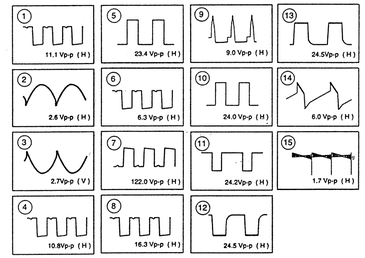
TRANSISTOR		*
Q4001	F-6	–
Q4002	F-6	–
Q4003	E-6	–
Q4004	B-5	–
Q4005	F-9	–
Q4006	F-7	–
Q4007	D-4	①
Q4008	D-3	–
Q4009	D-3	–
Q4010	D-2	–
Q4011	B-4	①
Q4012	B-4	①
Q4013	C-1	①
Q4014	A-2	①
Q4015	A-4	①
Q4016	A-1	①
Q4017	C-4	①
Q4018	E-3	①
Q4019	C-4	①
Q4020	A-1	①
Q4021	B-1	①
Q4501	E-1	–
Q4502	F-3	①
Q4503	E-1	①
Q4505	E-3	①
Q4506	E-2	–



NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.



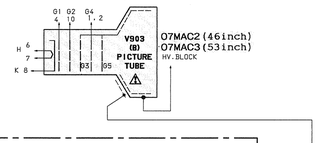
• E BOARD WAVEFORMS

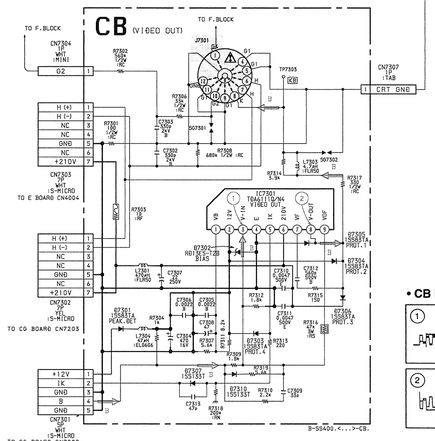


E BOARD IC VOLTAGE LIST

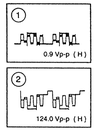
Pin	Voltages
IC4001 1	3.1
2	7.3
3	8.7
4	-12.0
5	1.3
6	2.1
7	1.4
8	12.3
IC4002 1	0
2	0
3	12.3
4	5.1
5	4.7
6	6.1
7	0
8	5.1
9	4.8
10	6.2
11	0
12	GND
13	0.2
14	0
IC4003 1	0
2	0
3	GND
4	-12.0
5	GND
6	0.6
7	1.6
8	12.3
IC4004 1	1.4
2	1.4
3	1.4
4	11.6
5	7.7
6	7.7
7	7.7
8	1.4
9	7.6
10	7.6
11	-11.3
12	3.3
13	3.3
14	3.3

All voltages are in V.





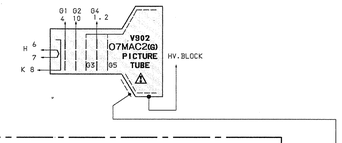
• CB BOARD WAVEFORMS

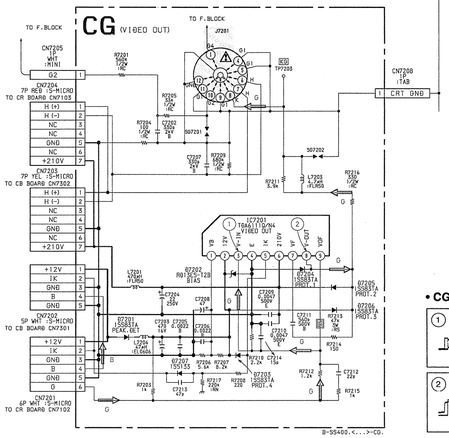


CB BOARD IC VOLTAGE LIST

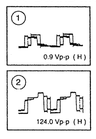
	Pin	Voltages
IC7301	1	4.5
	2	11.2
	3	4.1
	4	GND
	5	9.6
	6	210.3
	7	178.6
	8	178.9
	9	177.5

All voltages are in V.





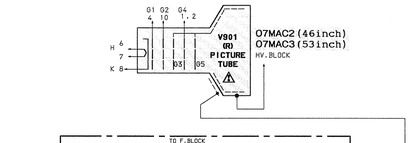
• CG BOARD WAVEFORMS

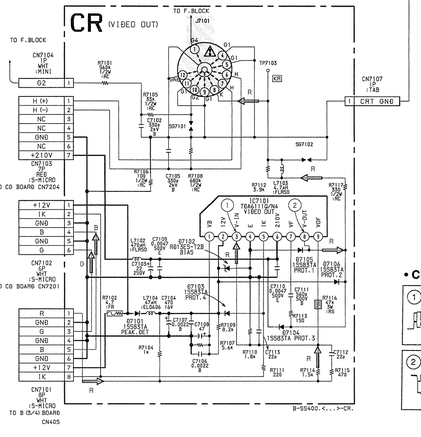


CG BOARD IC VOLTAGE LIST

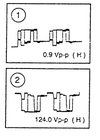
	Pin	Voltages
IC7201	1	4.5
	2	11.2
	3	4.1
	4	GND
	5	9.6
	6	210.3
	7	178.6
	8	178.9
	9	177.5

All voltages are in V.





• CR BOARD WAVEFORMS

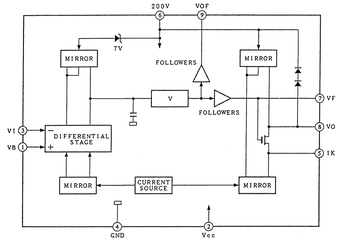


CR BOARD IC VOLTAGE LIST

	Pin	Voltages
IC7101	1	4.5
	2	11.2
	3	4.1
	4	GND
	5	9.6
	6	210.3
	7	178.6
	8	178.9
	9	177.5

All voltages are in V.

CB BOARD : IC7301 TDA6111Q/N4
CG BOARD : IC7201 TDA6111Q/N4
CR BOARD : IC7101 TDA6111Q/N4



6-5. SEMICONDUCTORS

BA10358F
BA10393F
LM358D
LM393PS
NJM2234M
NJM2235M
NJM2240M
TDA2822D
8 pin

CXA1817S
30 pin

CXA1855S
48 pin

CXD2018Q
48 pin

CXD2024AQ
80 pin

CXP85460-039Q
CXP85460-047Q
64 pin

CXP85112B-613S
64 pin

CX20125
8 pin

HD14053BFP
MC14053BF
16 pin

HEF4046BT-T
MC14046BDWR2
MC14053BCP
MC74HC163AF
MC74HC4053F
MC74HC123AP
TDA4665T-T
µPD4053BC
16 pin

LA7856A
PA0053B
TDA2579B
18 pin

LM358P
LM393P
NJM2058D
ST24C16CM1-TR/A
TEA2114
µPC358C
µPC393C
8 pin

MB81C1000A-70PJ-T5
MC14066BF
MC74F08DR2
MC74HC74AF
14 pin

MN1382S
MSP3410
P83C652FBA/532
44 pin

L78L05ACZ
LM78L05ACZ

NJM78M12FA
NJM7805FA
PQ09RF2
TA7812S

NJM7905FA
NJM7912FA

PM0002B
42 pin

PQ05RF1

PQ12RF1
4 pin

SAA4940H-T

SAA4951WP/V1-T

SAA7158WP-T
68 pin

SDA9187-2XGEG
SDA9188-3XPGEG
28 pin

STK392-040
22 pin

STV9379

TC4S66F
5 pin

TDA4650/V4
TDA4780/V3
28 pin

TDA6111Q/N4

TDA7265
11 pin

TDA8755T-T
32 pin

TDA9141-N2C
TDA9160A
32 pin

TL431CLP

TMS4C2970-28DT
36 pin

TPU3040-TC20
TPU3041TC-22-TP

µPC339C
14 pin

µPC574J

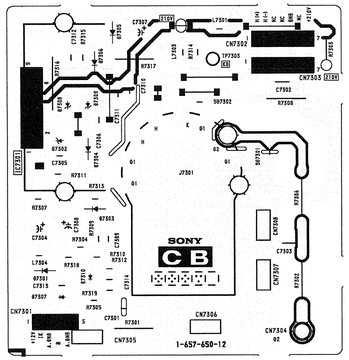
BF550

DTA144EKA-T146
DTC144EKA-T146
DTC323TK
2SA1037K-T-146-R
2SA1162G
2SC2412K-QR

Schematic diagrams
← E board CB CG CR board →

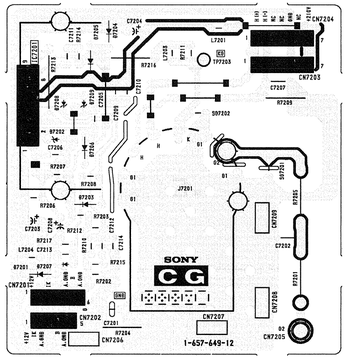
CB [B OUT]

– CB BOARD –



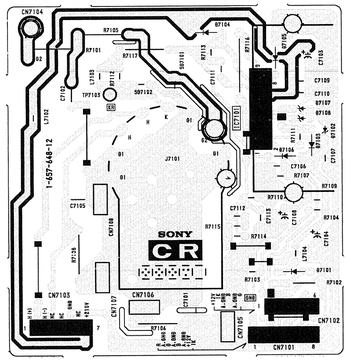
CG [G OUT]

– CG BOARD –



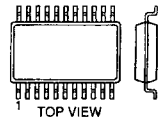
CR [R OUT]

– CR BOARD –



6-5. SEMICONDUCTORS

BA10358F
BA10393F
LM358D
LM393PS
NJM2234M
NJM2235M
NJM2240M
TDA2822D

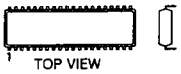


8 pin

CXA1817S

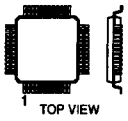
30 pin

CXA1855S



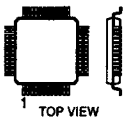
48 pin

CXD2018Q



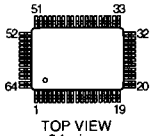
48 pin

CXD2024AQ



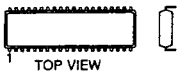
80 pin

CXP85460-039Q
CXP85460-047Q



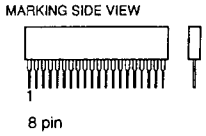
64 pin

CXP85112B-613S



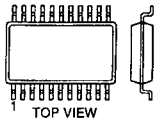
64 pin

CX20125



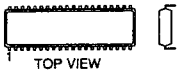
8 pin

HD14053BFP
MC14053BF



16 pin

HEF4046BT-T
MC14046BDWR2
MC14053BCP
MC74HC163AF
MC74HC4053F
TC74HC123AP
TDA4665T-T
µPD4053BC

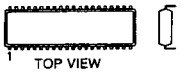


16 pin

LA7856A
PA0053B
TDA2579B

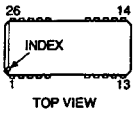
18 pin

LM358P
LM393P
NJM2058D
ST24C16CM1-TR/A
TEA2114
µPC358C
µPC393C

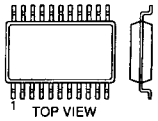


8 pin

MB81C1000A-70PJ-T5

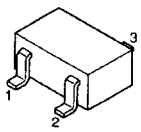


MC14066BF
MC74F08DR2
MC74HC74AF

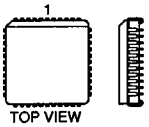


14 pin

MN1382S

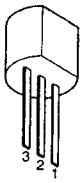


MSP3410
P83C652FBA/532

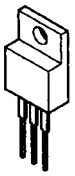


44 pin

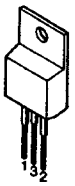
L78L05ACZ
LM78L05ACZ



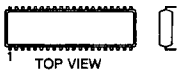
NJM78M12FA
NJM7805FA
PQ09RF2
TA7812S



NJM7905FA
NJM7912FA

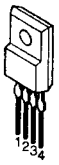


PM0002B

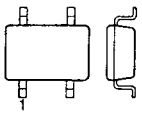


42 pin

PQ05RF1

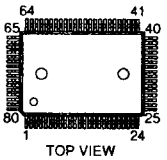


PQ12RF1

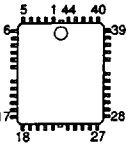


4 pin

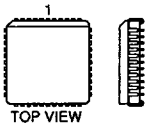
SAA4940H-T



SAA4951WP/V1-T

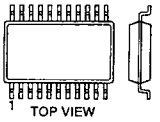


SAA7158WP-T



68 pin

SDA9187-2XGEG
SDA9188-3XPGEG

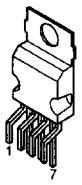


28 pin

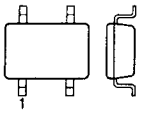
STK392-040

22 pin

STV9379

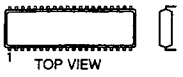


TC4S66F



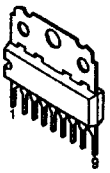
5 pin

TDA4650/V4
TDA4780/V3

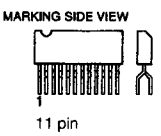


28 pin

TDA6111Q/N4

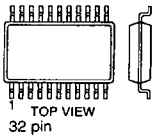


TDA7265



11 pin

TDA8755T-T



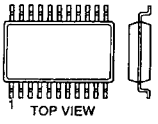
32 pin

TDA9141-N2C
TDA9160A

32 pin

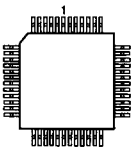
TL431CLP

TMS4C2970-28DT

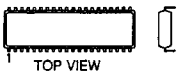


36 pin

TPU3040-TC20
TPU3041TC-22-TP

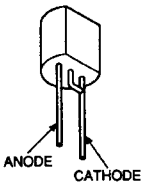


µPC339C

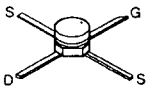


14 pin

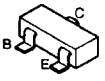
µPC574J



BF550

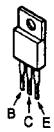


DTA144EKA-T146
DTC144EKA-T146
DTC323TK
2SA1037K-T-146-R
2SA1162G
2SC2412K-QR

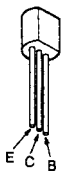


DTA144ESA
DTC144ESA-TP
2SC1740S-R
2SC3622A-LK

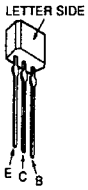
IRFI640
2SA1837
2SC4793



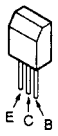
2SA1013-O
2SA1208
2SA1208S-TP



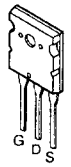
2SA1048-YGR
2SA1175-HFE
2SC2785-HFE



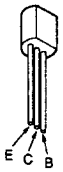
2SA1221-L
2SA1221-T-M
2SB733-34
2SB734-T-4
2SD774-34



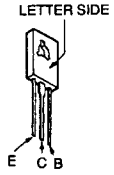
2SA1301-O



2SA933AS-QRT
2SC2878-AB

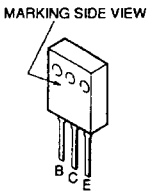


2SB649A
2SC2688-LK

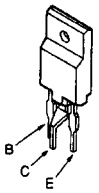


2SC1740S-R

2SC3997CA

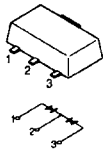


2SC4632LS-CB7

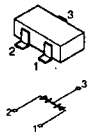


2SC4834P

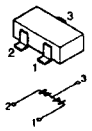
BAS16
BBY40



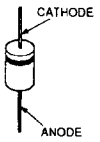
DAN202K



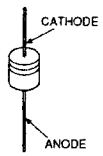
DAP202K



D1NL20
EGP20G
GP08
GP08DPKG23
HZT33-02
MTZ-T-72-22A
MTZ-T-72-33D
RD2.0SB-T1
RGP02-20EL-6394
RGP15GPKG23
1SS83

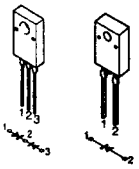


D1N20R
MTZJ-11B
MTZJ-4.3B
MTZJ-5.6B
MTZJ-5.6C
MTZJ-T-72-13B
MTZJ-T-72-27B
MTZJ-T-72-3.3B
MTZJ-T-72-5.6B
MTZJ-T-72-7.5B
RD11ES-B1
RD13ES-B2
RD22ES-B1
RD27ES-B2
RD33ES-B2
RD39ES-B2
RD4.3ES-B2
RD5.6ES-B2
1SS119-25TG
1SS133
11ES2

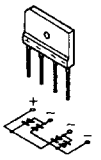


D10SC4MR

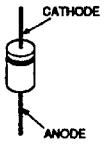
D10SC4M
D8LC40



D6SB60L-K
RBA-406B

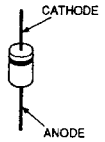


D2L40F
D2L40-TA

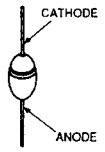


D5L60

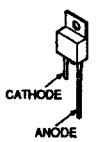
ERC06-15S
ERC91-02
S2LA20F



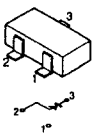
ERC38-06
V19E



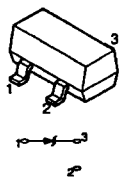
ERD08M-15



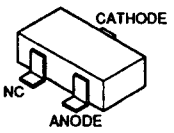
MA3024-TX
MA3033-L
MA3047-TX
MA3051M
MA3056M
MA3075M-TX
MA3091
MA3130
RD13M-B2
RD4.7M-B2
RD5.1M-B2
RD5.6M-B2
RD7.5M-B2



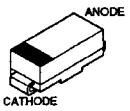
MA3091M-TX



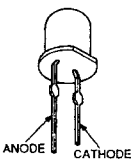
MA3240-TX



SC802-06



TLR124

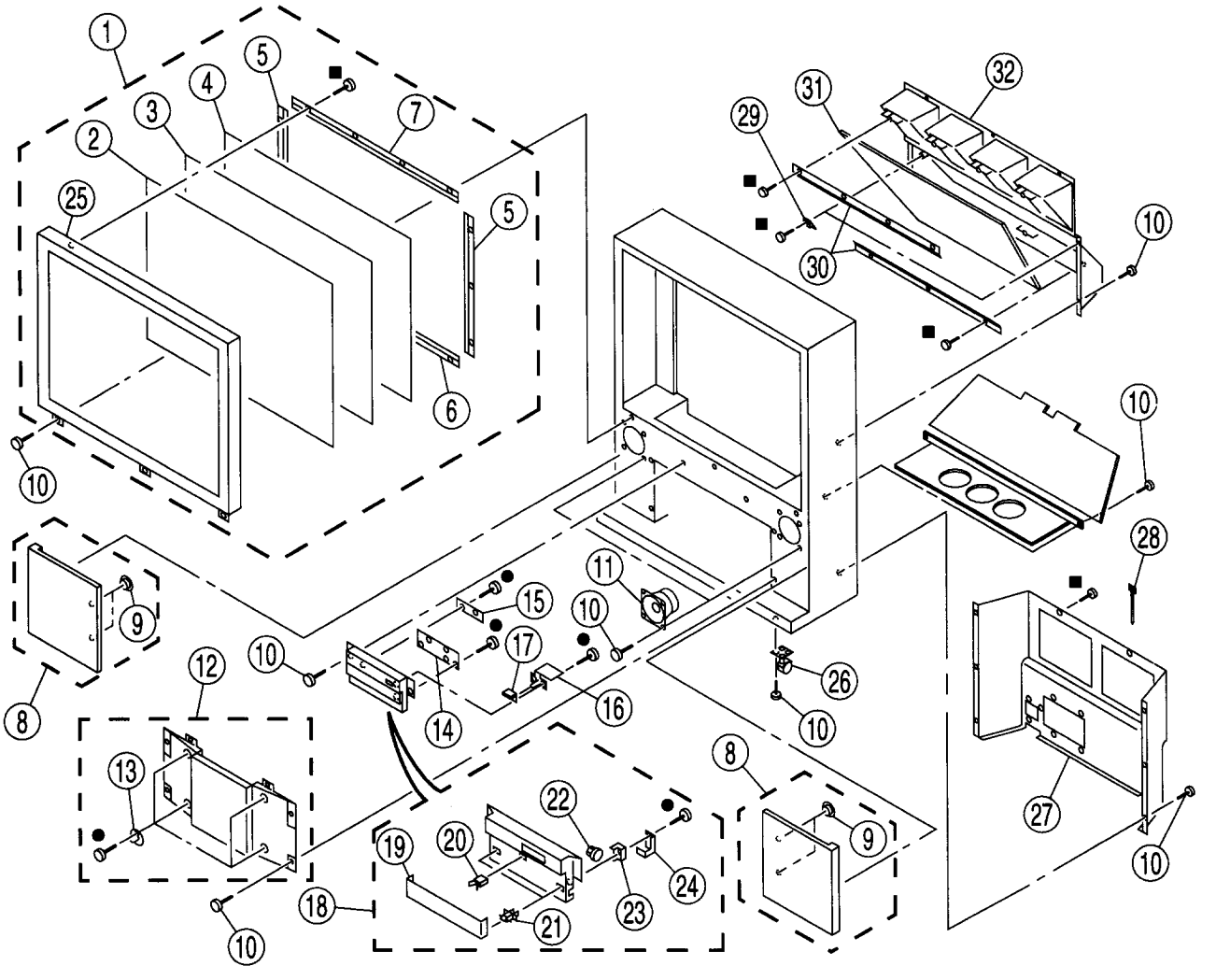


sont critiques pour la securite.
Ne les remplacer que par une
piece portant le numero specifie.

7-1. COVER (KP-46S4/46S4K/46S4U)

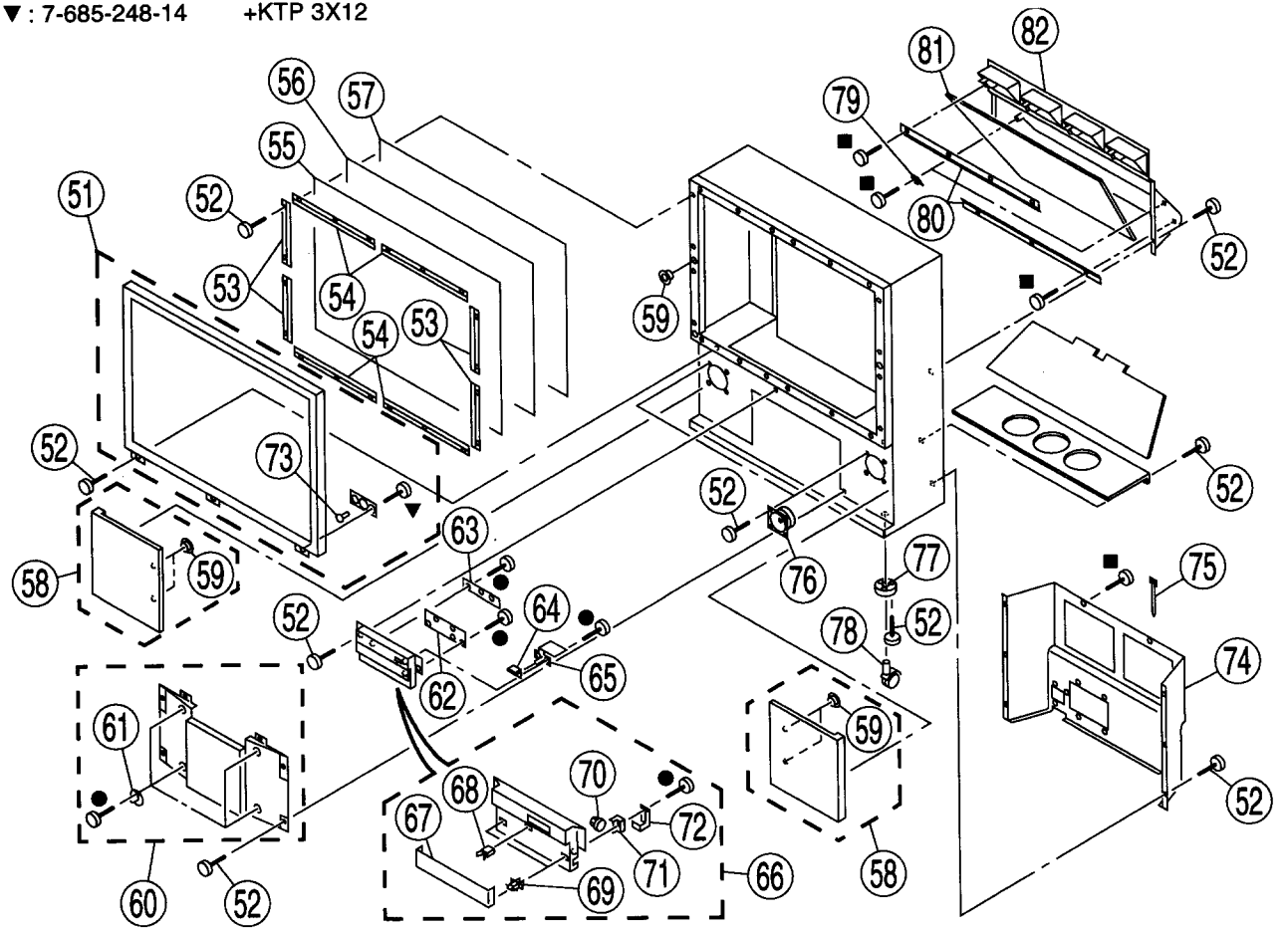
● : 7-685-648-79 +BVTP 3X12

■ : 7-685-663-79 +BVTP 4X16



7-2. COVER (KP-53S4/53S4K/53S4U)

● : 7-685-648-79 +BVTP 3X12
■ : 7-685-663-79 +BVTP 4X16
▼ : 7-685-248-14 +KTP 3X12

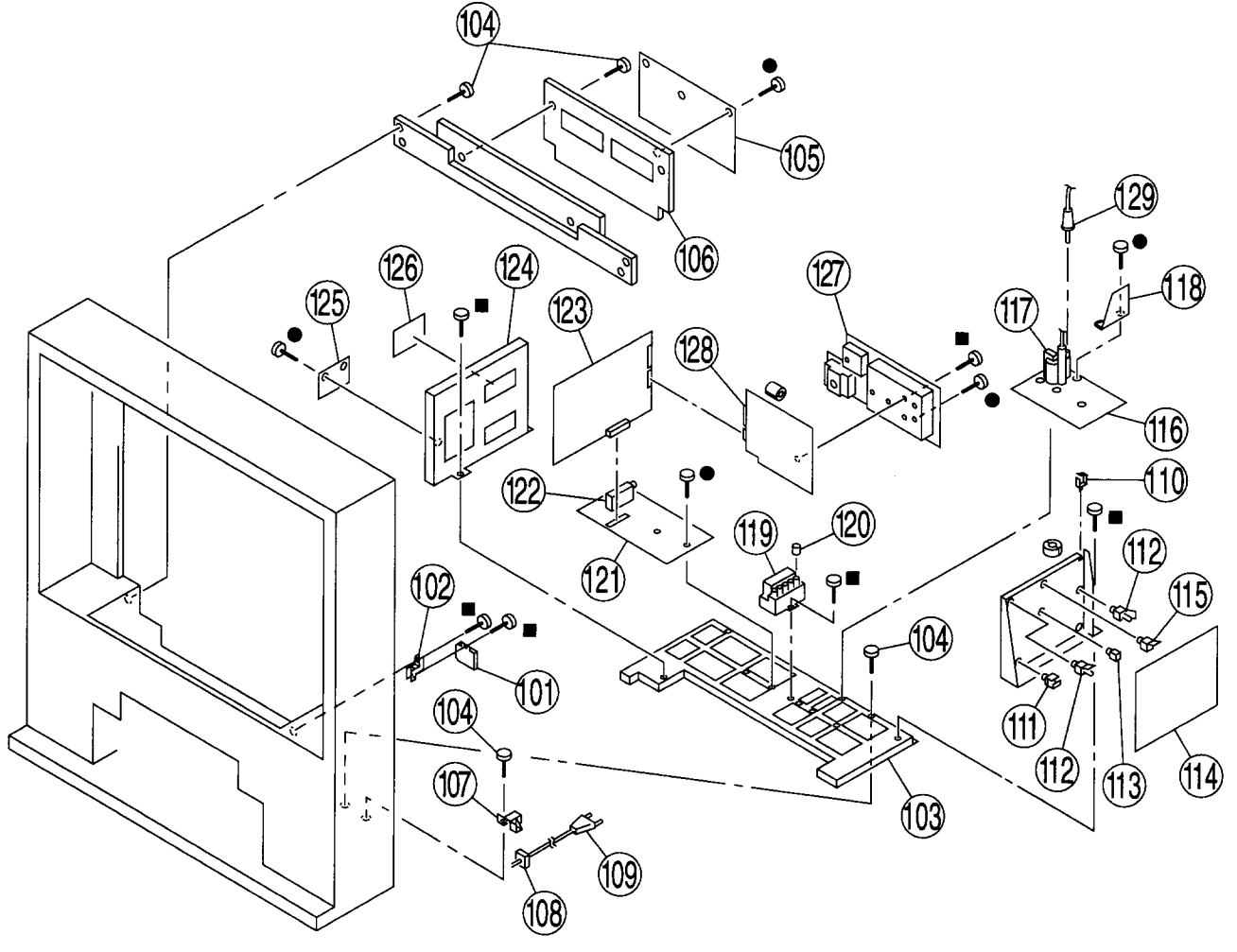


7-3. CHASSIS

● : 7-685-648-79 +BVTP 3X12
■ : 7-685-663-79 +BVTP 4X16

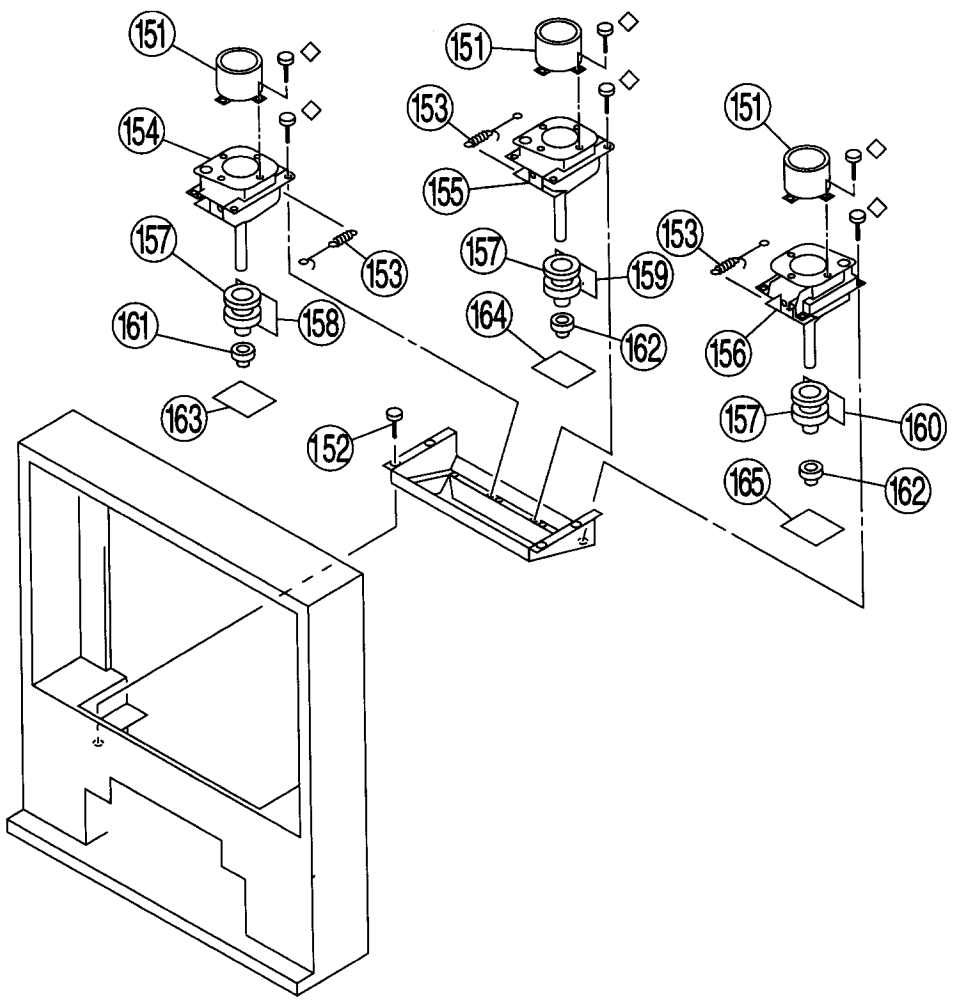
The componants identified by shading and mark ! are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ! sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.



7-4. PICTURE TUBE

◇ : 7-685-663-71 +BVTP 4X16

The componants identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.